

# Leading By Example

## Emission Reductions in Public Health Agencies

A Climate Masters Guide  
for the Public Health Sector

May 2010



## Table of Contents

EXECUTIVE SUMMARY .....	4
OVERVIEW AND PURPOSE .....	6
ASSESSING EXISTING EFFORTS AND CAPACITY .....	10
USING THIS MANUAL .....	12
OPPORTUNITIES FOR ACTION IN THE WORKPLACE .....	13
REDUCING ENERGY WASTE.....	13
GREEN BUILDING DESIGN.....	18
ALTERNATIVE ENERGY GENERATION .....	21
EMPLOYEE AND VISITOR TRANSPORTATION.....	23
FOOD.....	26
PURCHASING AND PRODUCTS.....	30
WASTE.....	33
WATER USE .....	38
CONCLUSIONS .....	40
OUTREACH.....	40
COLLABORATION.....	41
RESOURCES .....	43
APPENDIX: SAMPLE POLICY LANGUAGE.....	47

**The Climate Leadership Initiative** is a social-science based global climate change research, education, and technical assistance consortium between The Resource Innovation Group, a 501(c)3 nonprofit, and the Institute for a Sustainable Environment at the University of Oregon.

**The Oregon Coalition of Local Health Officials (CLHO)** represents the interests of local public health authorities and health officers in decision-making, accountability and leadership of Oregon's public health system. They consult with the Oregon Department of Human Services, Public Health Division on annual planning, funding and program decision making, minimum standards for personnel employed in local health departments, development and implementation of public health laws, and encourage accomplishments of public health standards across Oregon counties. CLHO strives to have representation from across the state and public health sector.

*Thank you to the Northwest Health Foundation for their funding of this project and to our external reviewers from Oregon Coalition of Local Health Officials, Multnomah County Public Health, Lane County Public Health and the Oregon State Division of Public Health.*

## EXECUTIVE SUMMARY

Climate change poses a significant and emerging threat to public health.<sup>1</sup> Drought, heat waves, flooding, and disease are all exacerbated by climate change. Across the globe, hundreds of thousands of deaths annually have been directly linked to a changing climate, while also indirectly affecting the health of a comparable number of people each year. In 1995, for example, a six-day heat wave in Chicago resulted in 525 heat-related fatalities, 208 deaths from health problems further complicated by heat exposure, and thousands of hospitalizations from heat-related symptoms.<sup>2</sup> Public health agencies and organizations can play a vital role in helping to prepare the public for these kinds of impacts, as well as reducing emissions that lead to further changes in our global climate. They are particularly well equipped to serve the most vulnerable populations in our communities such as low-income families who face disproportionate impacts of climate change, while having fewer resources to respond to these changes. In addition to the physical changes that will result from a changing climate, climate change and rising energy prices also have the potential to exacerbate social and health inequities.



Photo Credit: Multnomah County Healthy Homes Team

As the climate changes, possible health impacts include increases in asthma.

Reducing carbon emissions not only conserves resources, but also improves public health. The array of positive impacts, or “co-benefits,” of reduced carbon emissions include lower rates of obesity and associated chronic diseases, reduced cases of respiratory disease from lower levels of air pollution, higher rates of nutrition, awareness of where and how our food is produced, and lower rates of heat-related illness and mental illness as well as vector- and water-borne disease. Public health agencies are in the unique position to not only adopt lower-emissions practices, but to encourage others do the same through showcasing a commitment to efforts such as reduced energy use, alternative energy generation, green building design, alternative transportation options,

sustainable food choices, green purchasing practices, waste reduction, and responsible water use. By prioritizing these operational shifts, public health agencies can help to reduce carbon and other greenhouse gas emissions in our atmosphere, while also empowering employees and others in the community to change their own behavior.

In 2008, the Climate Leadership Initiative at the University of Oregon and the Oregon Coalition of Local Health Officials surveyed Oregon public health departments on their knowledge of climate change and its impacts on public health, the actions they are taking to prepare for these impacts, and the resources they need to take action. Many respondents expressed an interest in reducing

<sup>1</sup> The World Health Organization. Climate and health. <http://www.who.int/mediacentre/factsheets/fs266/en/index.html> (accessed Nov2009)

<sup>2</sup> Thornbrugh, Casey. “Are America’s Cities Ready for the Hot Times Ahead?” University of New Mexico, SOARS® 2001

greenhouse gas emissions, but felt they did not have the knowledge, tools, financial and staffing resources, or organizational commitment to do so.

This manual is a response to those concerns. It provides guidance on how to prioritize and implement the operational changes that allow public agencies to shrink their climate impact, and it also provides guidance about how to demonstrate a commitment to a healthy future.

**The following categories are discussed for addressing emissions reduction:**

- **Energy**
- **Buildings**
- **Transportation**
- **Food**
- **Purchasing**
- **Waste**
- **Water**

Under each topic, there are specific steps that individual public health departments or organizations can take. For each proposed step, there are estimated capacity needs, cost, and impact of implementation. In recognition that many departments are stretched for human and financial resources, the manual identifies actions that can be implemented immediately at little cost as well as those that may need long-term planning and budget allocation. Many departments are at the discretion of higher-up decision making at the local or state level, grant outcomes not geared to addressing climate change, or managing the interests of other building tenants. The manual suggests actions that can occur internally, as well as steps that can be taken for influencing decisions that are out of the control of health departments.

Because communication is key to making change either within the office, within your community, or at the state or territorial level, we've included a section with advice on how to address these issues both internally and externally. The concluding section provides a number of resources for the public health sector on climate change.

Your department can make a difference. Throughout this manual you will find references to case studies of groups that are already taking action. The Climate Leadership Initiative is available to support your efforts. For more resources, case studies, trainings, and discussions, please visit our public health webpage at <http://climlead.uoregon.edu>

*This manual and the survey referenced throughout were supported by the Northwest Health Foundation.*

## OVERVIEW AND PURPOSE

**T**here is unequivocal evidence that the Earth's mean surface temperature is rising and that the consequences of that temperature increase include increased risks to public health.<sup>3</sup> At the global scale, climate change is already contributing to disease and premature death, reduced air quality and increased respiratory disease, increased malnutrition due to depleted crop production, and the spread of infectious diseases.<sup>4</sup> Many of these impacts are already being felt within the United States, and national health care experts expect higher rates of heat-related mortality, exacerbated cardiovascular and pulmonary illness, and food and vector-borne diseases to rise significantly over the next few decades.<sup>5</sup>

In December of 2008, the Oregon Coalition of Local Health Officials (CLHO) and the University of Oregon's Climate Leadership Initiative (CLI) distributed a survey to public health workers across the 35 county health departments in Oregon. The survey found that, while many public health workers are aware of the need for reducing carbon emissions and preparing for risks associated with climate change, few know what actions they can take to reduce their department's emissions or how to integrate climate change preparation into existing planning efforts.

This manual is designed to help public health departments and community health organizations reduce climate-damaging emissions from their operations. A companion manual on climate change preparation for the public health sector has also been developed. In addition, emission reduction and climate change preparation trainings and tools accompany these two manuals and will be available on our public health webpage at: <http://climlead.uoregon.edu>.

### Who is the manual for?

This manual has been developed specifically for public health departments and community health organizations. However, the majority of the materials and resources will also be useful to any health practice or facility. With specific actions and resources identified in each chapter, this manual can be used as a standalone guide for emissions reduction. It can also be used to accompany in-person and online trainings, providing participants with detailed information and strategies to address each of the topic areas, and considering each agency's needs, capacity and financial resources. When considering the strategy recommendations in this manual, users will need to select recommended actions and activities that are most relevant to their place of work.

Throughout this document we have included specific case studies and research from Oregon and the Pacific Northwest. The intention is that this document is applicable to other parts of the country, and therefore the case studies can be replaced by local studies in the communities adapting this manual.

3 IPCC 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Avery, M. Tignor, and H.L. Miller (eds.)]. Cambridge University Press, Cambridge and New York.

U.S. Global Change Research Program. 2009. Global Climate Change Impacts in the United States. T.R. Carl, J.M. Mellilo, and T.C. Peterson (eds.). Cambridge University Press. 188 pp. (last accessed on 16 October 2009 at <http://www.globalchange.gov/whats-new/286-new-assessment-climate-impacts-us>).

4 The World Health Organization. Climate and health. <http://www.who.int/mediacentre/factsheets/fs266/en/index.html> (accessed November 2008)

5 Climate Change Science Program. 2008. Analyses of the effects of global change on human health and welfare and human systems. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. [Gamble, J.L. (ed.), K.L. Ebi, F.G. Sussman, T.J. Wilbanks, (Authors)]. U.S. Environmental Protection Agency, Washington, DC, USA.

## Manual and Program Training Goal

This project is a component of the Climate Master and Climate Preparedness programs, offered by the Climate Leadership Initiative, is a social-science based global climate change research, education, and technical assistance consortium between The Resource Innovation Group, a 501(c)3 nonprofit, and the Institute for a Sustainable Environment at the University of Oregon. The program seeks to identify effective methods of helping public and community health agencies reduce their greenhouse gas emissions and prepare for the impacts of global climate change. This manual and the training program that will accompany it are tailored specifically for the public health sector, including county public health departments, and community based health organizations. For more information, please contact Stacy Vynne: (541) 346-0467 or [svynne@uoregon.edu](mailto:svynne@uoregon.edu). You may also visit the Climate Leadership Initiative website at <http://climlead.uoregon.edu>

## Climate Change 101: Cause, Impacts and Role of Public Health

In 2007, the Intergovernmental Panel on Climate Change (IPCC) declared that the evidence is now “unequivocal” that the earth’s atmosphere and oceans are warming beyond natural variability.<sup>6</sup> The IPCC concluded that human activities – including emissions of carbon dioxide, methane, and other carbon emissions along with land clearing and development – are responsible for most of the Earth’s warming. Left unchecked, rising global temperatures and the changes in climatic patterns they cause will affect ecological health and thus undermine economic and social prosperity and security locally and abroad.

Globally, many communities are already beginning to experience the public health impacts of climate change, and these impacts are likely to increase into the foreseeable future.<sup>7</sup> St. Louis and Hess reported that:

*[Changes in climate] contribute to a wide array of health effects, including the direct effects of temperature and climatologic instability, such as heat waves, drought, and increased frequency and severity of extreme precipitation events. Secondary or “systems effects” are also included, such as those from positive or negative impacts on agriculture, clean water access, shifting geographic distributions of infectious diseases, migration, increased competition for scarce resources, and the potential for armed conflict...the health effects of climate change are increasingly manifest and may have a devastating effect on global health in the next several decades (p. 527).<sup>8</sup>*

<sup>6</sup> IPCC 2007. The IPCC is a scientific intergovernmental body set up by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), consisting of member governments and hundreds of top scientists from around the world.

<sup>7</sup> World Health Organization. 2005. Climate and Health: Fact Sheet. Available at: <http://www.who.int/globalchange/news/fsclimandhealth/en/index.html>

<sup>8</sup> St. Louis, M.E., and J.J. Hess. 2008. Climate Change Impacts on and Implications for Global Health. *American Journal of Preventative Medicine*. 35(5): 527-538.

In the United States, climate change is already having an adverse effect on public health, and these effects are expected to grow over the coming decades unless explicit efforts are made to prepare for and reduce the risks. In the future, extreme temperatures, increased ground ozone levels, droughts, floods, wildfire and severe weather events coupled with an aging population, changes in migration, and other socioeconomic factors will cause direct and indirect threats to health across the country.<sup>9</sup>

*Locally, these impacts will be expensive. A 2009 economic analysis produced by the Climate Leadership Initiative at the University of Oregon found that uncontrolled greenhouse gas emissions are likely to result in additional public health costs in Oregon of up to \$900 million by 2020 and over \$1 billion by 2040 (and those costs are already beginning to accrue).<sup>10</sup>*

To help protect against and prepare for these projected impacts, the public health sector should begin to prepare their employees and communities immediately. The public health sector can play a key role in reducing emissions, which is a necessary step. The IPCC states that carbon emissions must be reduced by 50 percent globally and 80% or more in the United States by mid-century to avoid potential catastrophic impacts, which requires action within two to three years at all levels of society. The Centers for Disease Control and Prevention (CDC) has outlined the potential health impacts of climate change (see Table 1).

**Table 1. CDC Potential Health Impacts of Climate Change<sup>11</sup> (SES=Socio Economic Status)**

Weather Event	Health Effects	Population Most Affected
Heat waves	Heat stress	Extremes of age, athletes, people with respiratory disease
Extreme weather events, (rain, hurricane, tornado, flooding)	Injuries, drowning	Coastal, low-lying land dwellers, low SES
Droughts, floods, increased mean temperature	Vector-, food-and water-borne diseases	Multiple populations at risk
Sea-level rise	Injuries, drowning, water and soil salinization, ecosystem and economic disruption	Coastal, low SES
Drought, ecosystem migration	Food and water shortages, malnutrition	Low SES, elderly, children
Extreme weather events, droughts	Mass population movement, international conflict	General population
Increases in ground-level ozone, airborne allergens, and other pollutants	Respiratory disease exacerbations (COPD, asthma, allergic rhinitis, bronchitis)	Elderly, children, those with respiratory disease
Climate change generally; extreme events	Mental health	Young, displaced, agricultural sector, low SES

9 Climate Change Science Program. 2008. Analyses of the effects of global change on human health and welfare and human systems. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. [Gamble, J.L. (ed.), K.L. Ebi, F.G. Sussman, T.J. Wilbanks, (Authors)]. U.S. Environmental Protection Agency, Washington, DC, USA.

10 Climate Leadership Initiative and EcoNorthwest. 2009. An Overview of Potential Economic Costs to Oregon of a Business-As-Usual Approach to Climate Change. <http://climlead.uoregon.edu/publications/climate-economics>

11 CDC Policy on Climate Change and Public Health <http://www.cdc.gov/ClimateChange/policy.htm>



The public health sector is well equipped to meet the carbon emission reduction challenge, as many actions are in line with health and nutritional goals of the sector. For instance, if they are physically able, encouraging visitors and staff to leave their car at home and bike, walk or take public transportation (if walking to bus/train stop) both reduces carbon emissions and improves health. In addition, government agencies or nonprofits have an obligation to be good stewards of public dollars. Reducing energy, water and materials use, and mitigating waste leads to cost-savings, which can be reallocated to programs. Public and community health agencies can also play a role in education and modeling climate change projections on public health for their specific community by working closely with research institutions, agencies, and nonprofit organizations. By setting an example at the agency level, visitors as well as employees may be inspired to also take action within their own homes and lives.

For those ready to meet the challenge, this new era is laden with opportunity. Despite increasing awareness of climate change and the cost savings available through efficiency measures, many opportunities to reduce energy, material use and waste in health facilities remain untapped. When taken advantage of, these opportunities may also increase the commitment and effectiveness of employees and clients, boost public image, and hedge against the risks of rising energy, water and material costs, all while reducing the damaging effect of carbon emissions. According to the National Governors Associations:

#### IDEAS IN ACTION



As part of Florida's "Leadership by Example" executive order that established more sustainable behaviors in state agencies,

the Florida Department of Health has made an institutional commitment to reducing carbon emissions and encouraging energy efficiency. The department evaluated policies based on emission reduction goals in the areas of transportation, purchasing, energy use in buildings, waste, and education. For example, the Florida Department of Health Division of Information Technology piloted a telecommuting program that showed an increase in productivity.

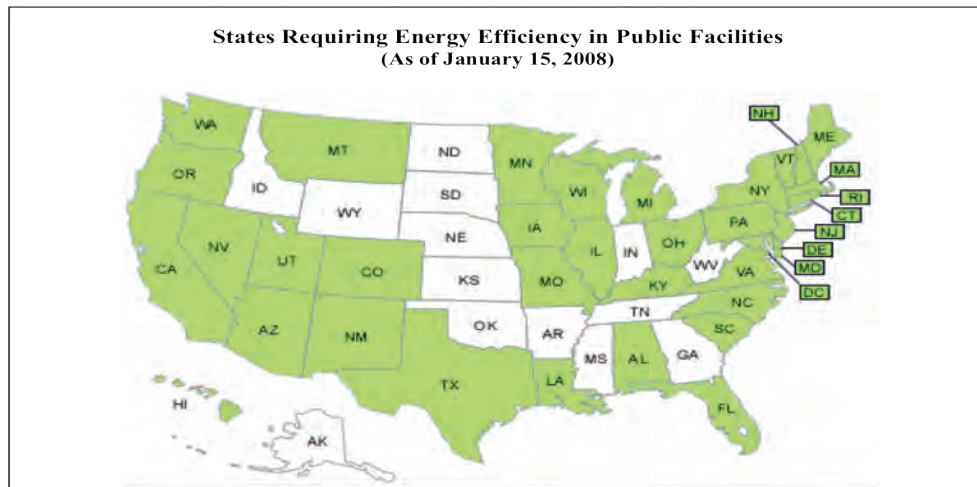
[www.doh.state.fl.us/Environment/greenPlanforDOH.txt](http://www.doh.state.fl.us/Environment/greenPlanforDOH.txt)

*Given that state and local governments spend more than \$11 billion a year on building-related energy costs and more than \$2.5 billion a year on operations and maintenance for some 500,000 state-owned vehicles, the opportunities for savings are significant. A "lead by example" clean energy initiative can decrease state building and fleet operations costs, educate state employees and the public, and provide other benefits, such as lower carbon emissions, that can inspire and inform citizens and the private sector alike.<sup>12</sup>*

Recognizing the opportunities for significant energy cost savings, many states have enacted a requirement for energy efficiency in public facilities (see Figure 1).

<sup>12</sup> Greening State Government: "Lead by Example" Initiatives. National Governors Association Center for Best Practices. 2008. [www.nga.org/Files/pdf/0807GREENSTATEGOVT.PDF](http://www.nga.org/Files/pdf/0807GREENSTATEGOVT.PDF)

Figure 1. States Requiring Energy Efficiency in Public Buildings (shaded) as of January 2008.  
Source: Environmental Protection Agency, via National Governor Associations report.



Source: U.S. U.S. EPA<sup>13</sup>

Energy waste audits and carbon reduction planning should be incorporated into all existing planning efforts. While there may be upfront costs for making changes, departments will see significant savings in the long run, and will benefit from long-term planning and investment. Our intention is not to create additional work for employees, but to provide guidance on strategies that complement existing efforts.

## ASSESSING EXISTING EFFORTS AND CAPACITY

**B**y taking proactive steps, public health and community health organizations can prepare for and lessen the health risks posed by climate change by reducing their own contribution to carbon emissions and building awareness and action within the community.

The first step toward effective emission reduction is to assess the actions your department or organization is already taking to reduce carbon emissions. Consider your existing planning activities and assess how current efforts to build a healthy and efficient workplace are already reducing the drivers of global climate change (e.g. carbon emissions). For example, are employees encouraged to shut down computers at night? Have you purchased recycled office supplies or energy efficient equipment? You may already be performing a number of activities that are reducing future health risks associated with climate change. These climate positive activities can lay the foundation for a strong carbon pollution reduction strategy.

Areas to consider when developing a carbon emissions reduction strategy (each of these areas is addressed in further detail below):

- ❑ **Reducing energy waste:** heating and cooling, lighting, electronics, office equipment, building envelope.
- ❑ **Green building design:** site selection, building materials, building efficiency, waste and renovations.
- ❑ **Alternative energy generation:** solar, biomass, geothermal, wind, on-site and off-site renewable energy.
- ❑ **Employee and visitor transportation:** bus, rail, bike, ride sharing, vanpooling, carpooling, fleet, reducing business travel, teleconferencing and telecommuting.
- ❑ **Food:** organic, in-season, local, nutritious.
- ❑ **Purchasing and products:** energy efficient equipment; environmentally preferable purchasing.
- ❑ **Waste:** reduce, reuse, recycle.
- ❑ **Water Use:** low flow, grey water, native plants, leaks.
- ❑ **Outreach:** communicating with the public about climate change and health.

## Conducting a capacity assessment

Capacity assessments generally involve an outside reviewer working with a number of staff to conduct thorough interviews to better understand everything from organizational structure to funding opportunities. Addressing the following questions can provide a preliminary understanding of capacity for implementing climate change mitigation strategies. You can also conduct an internal survey (online or paper-based) or hold interviews or focus groups with employees.

1. What is the staff's knowledge, training, or education on the causes of climate change and the appropriate measures to reduce emissions?
2. What opportunities exist to augment employee proficiency on the issue?
3. Has the department engaged in strategic planning exercises that include the reduction of carbon emissions?
4. What has been the department's historical response and ability to reduce emissions and/or incorporate environmental awareness in the past?
5. Do current departmental goals and operational plans include efforts to reduce emissions?
6. Are there long-term strategies and initiatives in place that are linked to emissions reductions?
7. Is climate change mitigation reflected in the budget and long-range financial plans?
8. What are the funding opportunities or constraints for integrating emission reductions into daily operations?
9. Does the department build and maintain collaborative relationships with other government agencies, nonprofits or businesses that can aid in climate change mitigation?
10. Is the department perceived within the community as a leader in mitigation efforts?

## Using this Manual

To help public health departments assess which actions they can implement in the short and long term, the following symbols are used throughout this document to denote estimated cost, capacity required, and impact on reducing greenhouse gas emissions for each proposed action (a checklist of all proposed actions is available in [Appendix A](#)):

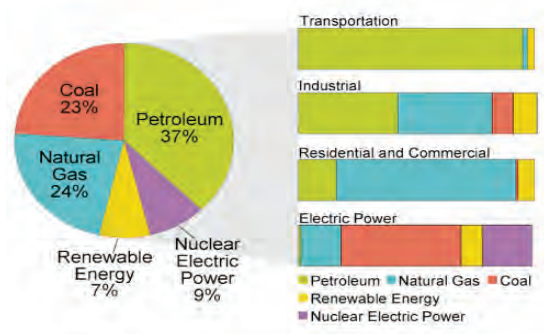
\$-\$\$\$\$	Cost of implementing the proposed action (note that many of the actions will result in money saved after a few years due to reduced utility expenses, waste disposal costs, etc.).
!-!!!!	Capacity needed to implement the proposed action.
⊖	No additional cost or capacity needed to implement the proposed action.
🌍-🌍🌍🌍🌍	Impact that proposed action has on reducing emissions.

## OPPORTUNITIES FOR ACTION IN THE WORKPLACE

### REDUCING ENERGY WASTE

**T**his section explores sources of energy demand in the workplace and efforts health departments and organizations can take to reduce and offset energy consumption. More than 85% of our energy consumption and nearly two-thirds of the electricity consumed in the United States is provided by fossil fuels (see Figure 2).<sup>13</sup> Eliminating energy waste and utilizing renewable energy technologies can improve public health by reducing the need for sources like coal-fired power plants that produce unhealthy air pollution. Addressing climate change is not only good for the environment and public health, it can mean reducing your utility costs as well.

**Figure 2. US Primary Energy Consumption by Source and Sector<sup>14</sup>**



#### Introduction to energy demand

To keep the building operational and comfortable for employees, every office demands energy through lighting, heating and cooling, and equipment such as computers and copiers. Even the necessities that give employees energy to get through their day, like the coffee pot and vending machine, need energy to operate. Quantifying energy consumption from buildings and the resulting emissions is challenging, as a truly inclusive calculation would incorporate energy used in building construction and materials, the life cycle

or embodied emissions of the equipment used within the building, and so on. Emissions are also dependent on the local energy portfolio and the source of electricity or fuel used to generate energy. For instance, buildings in the Northwest of the United States tend to contribute less carbon emissions than those in other states, because a larger proportion of power comes from low emitting sources such as hydroelectric, biomass combustion and nuclear.

According to a Department of Energy (DOE) report, energy demand from commercial buildings doubled between 1980 and 2000 due to increases in construction, size and addition of more equipment, such as computers. While the Energy Information Administration (EIA) estimates health care energy use to be about 9 percent (see Figure 3), this is mostly energy consumption by hospitals. However, all offices including public health departments and private health clinics have significant energy costs. The DOE estimates that a typical office space uses 80,000 BTUs per square foot per year. According to the Portland Office of Sustainable Development, office energy use per square foot is more than the average school, retail space, and church, averaging \$1.59 per square foot per year to power the office. However, with basic no-cost or low-cost changes that increase energy efficiency, offices have reported savings of 25 percent, or \$4,000 annually for a 10,000 square foot office.<sup>15</sup>

<sup>13</sup> US Department of Energy. <http://www.energy.gov/energysources/fossilfuels.htm>

<sup>14</sup> Energy Information Administration. [http://tonto.eia.doe.gov/energyexplained/index.cfm?page=us\\_energy\\_home](http://tonto.eia.doe.gov/energyexplained/index.cfm?page=us_energy_home)

<sup>15</sup> City of Portland, Office of Sustainable Development. 2001. Green Office Guide. 46 pages. <http://www.portlandonline.com/shared/cfm/image.cfm?id=111253>

According to the Oregon Department of Energy, Oregon schools and state government spend more than \$78 million a year on energy. Energy-saving opportunities are available for public buildings and can cut energy costs 10 to 20 percent, which if taken advantage of, results in average annual savings of \$16 million. The Oregon Department of Energy provides technical help to schools and state and local government to cut energy use and save tax dollars. Among other things, assistance from the state includes energy audits/evaluations, loans, assessments and design reviews.

## How to conduct an energy audit

You can find out more about your workplace's energy demands by conducting an energy audit. Before embarking on an audit, however, consider what your county facilities are currently tracking as far as energy goes? How can we encourage them to connect with local resources to get an audit? How do they prioritize energy audits given other financial constraints?

An energy audit begins with collecting monthly utility bills, or contacting the local utility company for an annual energy summary. Total your monthly bills, ensuring that you subtract out non-energy charges such as sewage and water. After you add up the costs, estimate a 5-15 percent savings that can be made from low- or no-cost measures, and set a target for reducing energy consumption. Energy audits can be expensive and time consuming, depending on how extensive you want them to be and how involved your staff want to be, however many state agencies, nonprofits and utilities offer audits at low- or no-cost. See the resources section for more information. \$-\$\$\$\$, !-!!!!

Create a strategic energy plan that communicates departmental or organizational commitment, energy goals and objectives, and sets in place a process for making progress. Good energy plans state objectives and goals. For example: "In the first 12 months, we aim to reduce electricity use by XX percent and natural gas use by XX percent." If your building is shared, talk with other tenants to get a building-wide agreement on energy reduction. If other tenants are not on board, set goals for your department. You can share the results of energy and cost savings with the other tenants and hopefully convince them to get on board. !

### Requesting Energy Audits:

Within the service area of Portland, OR, utilities such as Portland General Electric and Northwest Natural Gas provide energy audits to state agencies and businesses through professionals hired by the Energy Trust of Oregon (ETO) typically at no charge. ETO provides a fairly comprehensive audit and in 2009 conducted an audit for the building where the state's Division of Public Health resides. Other publically owned utilities in Oregon and across the country may provide a similar service. Even if there are no allocated funds to pay for the audit, in most cases implementation of the recommendations will more than off-set the costs.

Figure 3. Energy Use by Type of Building. Source: EIA.2006. Commercial Buildings

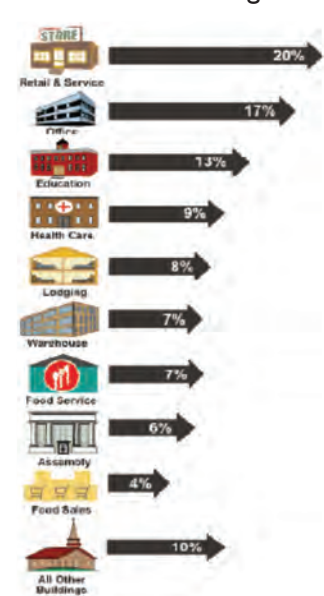
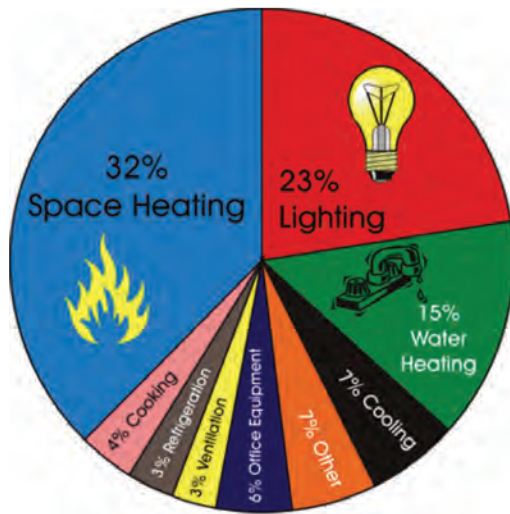


Figure 4. Energy Use by Type of Building  
Source: EIA.2006. Commercial Buildings



#### Consider the following questions:

- What are the processes for monitoring and documenting energy use?
- How does energy play into equipment purchases, and maintenance procedures?
- Is there demonstrated commitment to making improvements in energy consumption?
- Has management set energy-use targets?
- Who is accountable for energy use?
- Has there been energy-efficiency training?

#### Tips for developing and executing an effective energy plan:

- ❑ Assess greatest energy draws (see Figure 4) in order to prioritize where cuts can be made.
- ❑ Secure management support for reducing energy consumption.
- ❑ Form a staff team to build awareness and educate employees.
- ❑ Regularly service and maintain equipment, and purchase energy efficient replacements when appropriate.
- ❑ Train staff on proper use of equipment.
- ❑ Contact your local utility company for an energy audit.
- ❑ Set aside a small fund (e.g. \$10 for every new piece of equipment purchased) that can be invested in energy conservation.
- ❑ Hire or appoint a staff member or team to be an energy conservation manager.
- ❑ Commit to doing everything possible to reduce your workplace energy consumption and improve efficiency of your operations.
- ❑ Communicate your goals to staff and visitors relentlessly.
- ❑ Don't stop with an audit – continue to monitor your changes and savings!



## Ways to reduce energy waste

### HEATING AND COOLING

Heating, cooling and ventilation (HVAC) are the largest energy consumers in most buildings accounting for over 40 percent of office energy use.<sup>16</sup> However, small changes can result in huge savings. For every degree the thermostat temperature is raised in the summer, or lowered in the winter, you'll see a savings of 2-3 percent and prevent over 500 pounds of CO<sub>2</sub> from entering the atmosphere.<sup>17</sup> Additional tips include:

1. Set thermostat timers and keep windows and doors closed when outside temperatures are above 75° F or below 55° F. ☹️ 🌍
2. Encourage clothing appropriate to the weather, i.e. short sleeves in warm weather and sweaters and jackets in winter, in order to reduce thermostat to 68° F in winter and 72° F in summer. ☹️ 🌍
3. Reduce heating and cooling in less occupied areas of the building like corridors or basement. ☹️ 🌍🌍
4. Plant trees and install awnings, solar shade screens, or tinted window film to prevent too much sun from coming through the windows and heating offices. Also, painting a roof white is an effective cooling strategy in sunny climates. 💰 🌍🌍
5. Make sure your HVAC system is properly maintained, appropriately sized for your building, and has an Energy Star® rating. Consider outside air (OSA) dampers and economizers that shut off during unoccupied hours. 💰-\$\$\$ 🌍🌍
6. Insulate water heaters and reduce thermostats to 120° F. Incentives, rebates, or tax credits are likely available from your utility company or the state for installing solar water heating. ☹️ 🌍🌍

#### IDEAS IN ACTION



Oregon Health & Science University (OHSU) in Portland, which specializes in health research, education and patient care,

achieved a 61 percent projected energy savings by individually tailoring heating and cooling to different areas of their building based on need, as well as incorporating natural ventilation and sensors inside meeting rooms. OHSU also included sunshades and energy-efficient windows and wall insulation to create a solid building envelope. OHSU's daylighting and light sensors efforts are expected to save an annual \$20,000 in energy costs.

[www.nrdc.org/buildinggreen/casestudies/ohsu.pdf](http://www.nrdc.org/buildinggreen/casestudies/ohsu.pdf)

### LIGHTING

Lighting accounts for 23 percent of the total energy expenditures for a commercial building. Simple changes in lighting can greatly reduce these costs and your building's emissions. For example, implementing daylighting strategies (e.g. positioning windows and reflective surfaces in ways that offer natural internal light during the day) can save 50-80 percent off your lighting energy bill.<sup>18</sup>

1. Have staff turn off lights (put reminder stickers on light switches or doors) when they leave a room or install occupancy sensors and dimmers. ☹️ 🌍
2. Rearrange offices to take advantage of natural lighting. If remodeling, install skylights to increase the amount of daylight that enters the office. ☹️ 🌍🌍

<sup>16</sup> City of Portland 2001

<sup>17</sup> Hart, R. 2002. Energy Smart Operations. Eugene Water and Electric Board. 4th Edition.

<sup>18</sup> City of Portland 2001



3. Use task lighting by focusing lights on areas of the room where employees are working instead of lighting the entire space with overhead lights. ☹️ 🌍
4. Replace incandescent lights with compact fluorescents lights (CFLs). \$ 🌍🌍
5. Outdoor lights can be switched from a mercury vapor fixture (which is typically used) to high pressure sodium or fluorescent lighting, cutting your energy consumptions and costs in half. \$ 🌍

## ELECTRONICS AND OFFICE EQUIPMENT

While the energy consumed by electronic and office equipment is only a small portion of total energy use in the average office building, for the public health sector, electronic and office equipment use is a significant consumer of energy. Small changes in employee behavior can make huge cuts in energy consumption. For instance, switching equipment off at night and having it sleep when not actively in use during the day can reduce energy consumption by 80 percent.<sup>19</sup>

1. Turn off items that are not in use. A smart plug strip can make it easier to remember to turn off all equipment at the end of the day. You can also install “Smart Strips”—power strips that can be set to automatically power down equipment that is left idle for a specified amount of time. ☹️ 🌍
2. Power down computers. Use a program, enlist help from your IT staff, or educate all employees to automatically set all computer monitors to go into sleep mode after 5-10 minutes of inactivity, and the hard drive to sleep after 20 minutes. ☹️ 🌍
3. Encourage staff and visitors to use the stairs instead of elevators. It’s better for your heart and the planet! ☹️ 🌍
4. When purchasing new equipment like computer monitors or printers, buy “Energy Star®” and “EPEAT®” labels.<sup>20</sup> \$ 🌍🌍
5. Vending machine suppliers can remove or turn off the advertising lights in the machine. Inexpensive occupancy sensors can also be installed that power down the machines when not in use, while still keeping drinks cold. \$ 🌍

### IDEAS IN ACTION



Following the lead of the Veterans Health Administration (VHA), the Southern Oregon Rehabilitation

Center and Clinics (SORCC) in White City Oregon made environmental accountability an integral part of their planning process. The SORCC Green Environmental Management System (GEMS) is the facility’s environmental policy and encourages employees to conserve energy and reduce waste. The GEMS committee consists of staff from all levels of the organization with regular meetings to evaluate conditions and needs including recycling and green purchasing programs.

[http://www.visn20.med.va.gov/southern-oregon/sorcc\\_gems\\_dec05.asp](http://www.visn20.med.va.gov/southern-oregon/sorcc_gems_dec05.asp)

➡️ **“Green purchasing” refers to preferential purchasing of environmentally friendly supplies and equipment, another set of strategies to reduce health sector contribution to climate change.**

—Framing Health Matters, Frumkin et al. *American Journal of Public Health*, March 2008, Vol 98, No. 3

<sup>19</sup> City of Portland 2001

<sup>20</sup> Energy Star® is an efficiency rating program from the Environmental Protection Agency. EPEAT® is an efficiency rating program from the Green Electronics Council.

## BUILDING ENVELOPE

Air can leak in and out of the building, making it uncomfortably hot in the summer or cold in the winter, and causing your energy bill to skyrocket. Simple steps as well as long-term changes to your building can prevent air leakage.

1. Keep doors closed. Ensure automatic doors are functioning properly to prevent drafts and keep loading doors closed when not actively in use. 🚪 🌍
2. Slit panel curtains can help regulate building temperature when used in doorways of high activity. \$ 🌍
3. Seal up your building. One of the quickest dollar-saving tasks you can do is caulk, seal, and weather strip all seams, cracks, and openings to the outside (plumbing, cable, telephone, wiring, outlets). You can save as much as 10 percent on your heating and cooling bill by reducing the air leak in your building. \$ 🌍🌍
4. Replace windows. Use plastic storm windows or encourage the building owner to invest in double- or triple-paned glass or permanent storm windows. They can cut your heat loss in half. \$\$ 🌍🌍
5. Prevent solar glare. Using blinds or shades on windows can prevent direct solar gain. \$ 🌍

After all steps have been made to reduce energy consumption, you can look to renewable energies to ensure that your power source is “green”. Many utility companies offer their customers the option to purchase solar, biomass, geothermal, wind or other “green” energies at low cost. Green energies emit little or no carbon emissions during production. By setting an example of energy conservation in your office building, you can encourage your visitors and employees to do so in their own lives.

## GREEN BUILDING DESIGN

**B**uilding operations account for a substantial proportion of energy use in the United States. Design, construction and operation of buildings account for over 20 percent of the nation’s economy and over 40 percent of energy use and CO<sub>2</sub> emissions.<sup>21</sup> Emissions come from the entire life cycle of a building — including raw materials extraction, product manufacturing, construction or renovation, operation and maintenance, and decommissioning.

According to Sustainable Oregon, by promoting and applying green building practices, government agencies and departments can help stimulate economic growth and build demand for innovative and efficient building materials, energy systems, and related services provided by local firms. Local government agencies can help by developing strong policies, political and business champions, and effective technical support. A solid green building program is the cornerstone for advancing sustainable development in your community.<sup>22</sup> With public health departments and health care in general setting an example for the community, other agencies, businesses and individuals may be encouraged to make changes.

21 United States Green Building Council, 2003. “Building Momentum- National Trends and prospects for high-performance buildings.” Prepared for the U.S. Senate Committee on Environment and Public Works By the U.S. Green Building Council

22 [www.sustainableoregon.net/toolkit/green\\_building.cfm](http://www.sustainableoregon.net/toolkit/green_building.cfm)

## Going Green

Reducing building emissions is not only good for the environment, but also improves employee productivity and health.<sup>23</sup> According to the United States Green Building Council, green building is “designed, constructed, and operated to boost environmental, economic, health and productivity performance over that of conventional building.”<sup>24</sup>

➔ *Oregon’s State Energy Efficiency Design Program (SEED) requires that facilities constructed or purchased by state agencies “be designed, constructed, renovated and operated to minimize the use of nonrenewable energy resources and to serve as models of energy efficiency.”<sup>25</sup>*

Figure 5. Integrated Design Approach from the Whole Building Design Guide<sup>26</sup>



Whether constructing a new office building or renovating an existing building, opportunities exist for implementing changes that reduce emissions, improve energy efficiency, and increase worker productivity.<sup>27</sup> Green building can come with a 2 percent increase in costs over traditional building construction, but typically pay for themselves in terms of energy and cost-savings in a short amount of time.<sup>28</sup> If an opportunity emerges to relocate or design a new space, the suggestions in this section could be incorporated into requests. By making the requests, public health departments may be able to influence the renovation or construction of future public buildings. \$\$\$-\$\$\$\$ 🌍🌍🌍

Before construction on a new building or remodeling begins, a team can identify clear targets for sustainability and low emissions. Renovation of existing buildings can be the most sustainable approach, due to reductions in embodied energy and emissions of materials.

If your agency or organization has the opportunity to construct a new building, major considerations include:

**1. Site Selection and Size.** Building location has a great impact on design, construction, emissions generation, and employee productivity. For instance, an energy efficient building constructed from recycled materials but located 20 miles outside of town, may produce fewer direct emissions from the building itself, but will increase commuting emissions. Buildings also impact wildlife habitat and have large impacts on the surrounding ecosystem, which in some cases leads

23 Shannonhouse, R. 1997. Employers find green buildings can boost worker productivity. Village Life. Available at: [http://www.villagelife.org/news/archives/CS\\_environmentalism/green\\_buildings.html](http://www.villagelife.org/news/archives/CS_environmentalism/green_buildings.html)

LaMonica, M. 2005. Selling green buildings with people power. Available at: [http://news.zdnet.com/2100-9589\\_22-145314.html](http://news.zdnet.com/2100-9589_22-145314.html)

“High Performance Buildings Deliver Increased Comfort” [www.seattle.gov/light/conserve/sustainability/studies/cv5\\_sc.htm](http://www.seattle.gov/light/conserve/sustainability/studies/cv5_sc.htm)

24 USGBC 2003 pg 4

25 <http://oregon.gov/ENERGY/CONS/SEED/index.shtml>

26 [http://wbdg.org/wbdg\\_approach.php](http://wbdg.org/wbdg_approach.php)

27 USGBC 2003

28 Kats, G.H. 2003. Green Building Costs and Financial Benefits. Available at: <http://www.cape.com/ewebeditpro/items/O59F3481.pdf>

## IDEAS IN ACTION



Mint Dental Works in Portland, Oregon built the first Leadership in Energy and Environmental Design Program

(LEED) approved certifiably “green” dental office in the United States. Dr. Jason MacMillan says, “One of the most exciting aspects of our project was our commitment to work salvaged products into the design of our space.” From equipment choices that minimize the use of natural resources, to low-voc paints and materials that improve air quality and FSC-certified (Forest Stewardship Council) wood products, the building was designed with a healthy environment (as well as employees and clients) in mind.

[http://sidekickmag.com/office\\_design/articles-office-design/the-“greening”-of-mint-dental-works-dr-jason-mcmillan-portland-or\\_181.html](http://sidekickmag.com/office_design/articles-office-design/the-“greening”-of-mint-dental-works-dr-jason-mcmillan-portland-or_181.html)

to carbon emissions through release of carbon stored in disturbed soils or removal of carbon absorbing trees. Design, construction and maintenance of buildings can reduce its impact on habitat, lower water use, and reduce the urban heat island effect. The heat island effect is when a metropolitan area is significantly warmer than its surroundings due to lack of vegetation and expansive areas of concrete and buildings. High density urban areas can be 1.8–5.4°F warmer during the day, and in the evening have a difference in temperature as high as 22°F<sup>29</sup>. Optimize your building space so that minimal materials are used in construction and operation. Building small can free up costs for higher quality materials and results in more interactions between employees! By working closely with an architect that has experience in “green” design, you can build or renovate your office to ensure its impact is minimal.

**2. Building Materials.** When constructing or renovating a building, the following materials should be used to the extent possible: recycled and salvaged materials to lower costs and waste going to landfill; certified materials, such as Forest Stewardship Council certified sustainably grown wood products; local materials,

to reduce transportation-related emissions; and low lifecycle emission materials, such as cork, straw or bamboo instead of concrete, and low or no-VOC paints; and durable materials, to reduce replacement costs and waste from long-lived materials.

**3. Building Efficiency.** New and old buildings should be designed or renovated to maximize energy efficiency, such as through passive solar heating and cooling and making use of daylighting. The building should also be designed to be flexible or adaptable to future use.

**4. Waste and Renovations.** For new construction, remodeling, or “spring cleaning” in the office, ensure that waste disposal is avoided as much as possible by identifying a site for collecting recyclable equipment and materials. When renovating existing buildings, maintain materials that can be reused, including structure, building envelope and elements. This will save on embodied emissions (and costs) associated with new materials. Remove elements that may be hazardous and upgrade those that can improve energy and water efficiency.

Your building is more than a space to work, as it can be used to educate your staff, visitors and medical suppliers on the environmental impacts of buildings and how to minimize these impacts.

<sup>29</sup> EPA Heat Island Effect <http://www.epa.gov/hiri/>

## ALTERNATIVE ENERGY GENERATION

**A**fter all steps have been made to reduce energy consumption and create an energy efficient workplace, you can look to renewable energies to ensure that your power source is “low carbon”. Many utility companies offer their customers the option to purchase solar, geothermal, wind energy at low cost. Alternative energies emit little or no carbon emissions during production. By setting an example of energy conservation in your office building, you can encourage your visitors to do so in their own lives. In addition, by supporting energy alternatives, you are supporting public health conditions in the areas where the energy is generated, as “green” alternatives are less polluting than traditional sources of energy such as coal.

Transitioning to alternative energies varies in cost, for instance installation of solar panels typically have high upfront-costs, but a payback period over 10-20 years (after which energy can be ‘sold’ back to the utility company). However, state agencies may have an opportunity for reduced or no-cost installation, so check with the Department of Energy. \$\$\$-\$\$\$\$\$ 🌍🌍🌍

### IDEAS IN ACTION



The Athens City County Health Department in Ohio installed photovoltaic panels to provide backup power to the

department during emergencies (such as maintaining controlled temperatures for vaccines). The solar electric system feeds back into the local grid lowering electric bills for the Health Department while also serving to improve air quality. The Centers for Disease Control and Prevention (CDC) provided funding to the Ohio Department of Health for public health infrastructure upgrades.

<http://www.energyvortex.com/pages/headlinedetails.cfm?id=1139&archive=1>

Renewable energy is a \$1.4 billion a year industry in the Pacific Northwest and is expected to provide 12,000 jobs by 2020. Oregon is a national alternative energy leader with two major power companies that supply customers with alternatives to fossil fuel, including wind, solar, and biomass.<sup>30</sup>

### SOLAR

Photovoltaic (PV) panels – more commonly known as “solar panels” – convert sunlight directly into energy. A solar electric system should face south (although east or west is fine in some cases) and should have unshaded exposure to the sun between 9:00 a.m. and 3:00 p.m. year-round. The percentage of electricity that rooftop solar installation can cover depends on the building’s energy use and the size of the panel.

Oregon requires the inclusion of solar technology in new public building projects, stating that public entities (such as state agencies, school districts and local government) spend at least “1.5 percent of the total contract price of

a public improvement contract for new construction or major renovation of a public building on solar energy technology.”<sup>31</sup>

### GEOTHERMAL

Geothermal energy uses underground reservoirs of hot water and steam to produce electricity. Utilities can use these reservoirs to supply electricity to customers through geothermal power plants. Another method is geothermal heat pumps that draw heat from the ground and result in energy and financial savings, as well as reduced air pollution. Geothermal hot water can also be used directly to heat buildings, agriculture or industry.<sup>32</sup>

30 Degrees of Danger: Health Effects of Climate Change and Energy in Oregon. Physicians for Social Responsibility

31 [www.oregon.gov/ENERGY/CONS/PublicSolar.shtml](http://www.oregon.gov/ENERGY/CONS/PublicSolar.shtml)

32 [http://www.nrel.gov/learning/re\\_geothermal.html](http://www.nrel.gov/learning/re_geothermal.html)

## WIND

Wind turbines allow us to capture the wind's energy. The large blades of a wind turbine are connected to a rotor that spins a generator in the shaft of the turbine to produce electricity. Utilities use large groups of turbines, in the form of wind plants, to supply power to customers. Small wind systems – such as single wind turbines – can also be erected to reduce public, residential and commercial energy costs.<sup>33</sup>

### On-site Renewable Energy

Producing and consuming renewable energy onsite is a way to ensure a reliable and sustainable operation. Renewable energy is derived from sources other than fossil fuels that can be continually produced without reducing key natural resources or negatively affecting people. Renewable generation displaces less environmentally friendly forms of energy production that burn fossil fuel and cause air and water pollution.

Onsite generation of renewable energy can have high upfront costs. However, many of these systems can pay for themselves in as few as five years. After this point, all energy produced is “free” and if net metered can be sold to the utility, in some cases result in profit. The electricity produced by renewable generation is the same as conventional means of generation and leaves a positive environmental impact by comparison.

#### IDEAS IN ACTION



In 2001, the City of Portland was one of the first municipalities in the nation to adopt a green building policy for its own facilities. The policy contained strategies and performance thresholds for all new and remodeled City-owned facilities.

<http://www.portlandonline.com/bps/index.cfm?c=41701>

### Off-site Renewable Energy

If onsite construction of renewable energy is not feasible, renewable energy can typically be purchased from an off-site utility for a reasonable price as part of the building's operating costs. Renewable energy certificates (RECs) are a method documenting and tracking the environmental attributes of renewable energy generation. Many utilities and independent companies sell RECs in blocks of 100 or 1,000 kilowatt hours for an extra charge per kilowatt hour. The additional contribution provides the funding to support the generation of power from renewable sources.

33 [http://www.nrel.gov/learning/re\\_wind.html](http://www.nrel.gov/learning/re_wind.html)



## EMPLOYEE AND VISITOR TRANSPORTATION

**P**er capita energy use for transportation is highest in North America compared to other regions of the world, and it is expected to grow by almost 4 percent per year through 2020.<sup>34</sup> Making up more than one quarter of carbon emissions, transportation is the fastest growing sector of climate-damaging emissions in the United States.<sup>35</sup> That figure would be even greater if it accounted for “lifecycle” emissions from vehicle manufacturing, road construction and maintenance, and the extraction and refining of fuel. Although transportation habits are ingrained in our behavior and can be challenging to change, simple shifts can result in significant emission reductions.

### Introduction to transportation

Employee transportation to and from work and business-related travel create carbon emissions beyond the office building. Every day, Americans on average commute 44 miles – that’s almost 11,000 pounds of CO<sub>2</sub> per year and \$650 a month from gas, wear and tear and parking costs.<sup>36</sup> In the public health sector, client visits add further transportation emissions. The way your employees and visitors commute affects not only budgets, but also health and productivity. In addition to reducing emissions, alternative transportation options can lower rates of respiratory and heart disease, reduce accident rates and contribute to a higher quality of life with increased daily exercise from biking or even walking to public transit.<sup>37</sup>

Employees and employers can benefit by using alternative transportation, as can patients or colleagues who visit your workplace. Access to transportation is particularly problematic for low-income families and seniors, meaning fewer trips to the doctor due to insufficient transit options.<sup>38</sup> Public Health Departments can offer support to employees and visitors by providing maps or guidelines for transportation options (e.g. bus lines and bike routes), circulating carpool sign-up sheets, and offering adequate bike parking. By providing a variety of options for how employees and visitors access your office, you can save money on parking facilities, reduce emissions, and create a healthier working environment. In addition, these actions can be easily implemented without review from higher-up decision makers at the state level, and can influence other agencies across your state.

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34 Energy Information Administration. “Transportation Energy Use.” <http://www.eia.doe.gov/oiaf/archive/ieo00/transportation.html>

35 United States Environmental Protection Agency, “Greenhouse Gas Emissions from Transportation and Other Mobile Sources.” <http://www.epa.gov/otaq/greenhousegases.htm>, Updated April 25th, 2007.

36 City of Portland, 2001.

The Wall Street Journal “The Cost of Parking Rises.” <http://blogs.wsj.com/developments/2008/07/11/the-cost-of-parking-rises-manhattan-boston-san-francisco-top-list/>

37 APTA, Public Transportation: Benefits for the 21st Century

[http://apolloalliance.org/wp-content/uploads/2009/04/aptatwenty\\_first\\_century.pdf](http://apolloalliance.org/wp-content/uploads/2009/04/aptatwenty_first_century.pdf)

38 APTA, The Route to Better Personal Health [http://www.apta.com/research/info/online/better\\_health.cfm](http://www.apta.com/research/info/online/better_health.cfm)

## Alternatives to single passenger vehicle transportation

### BUS

A full bus is the equivalent of taking 40-70 cars off the roads, yet it only takes up the space of 2-3 cars.<sup>39</sup> Provide bus maps for visitors and employees to encourage use of convenient bus routes.

\$ ! 🌐 Some agencies may also be able to subsidize bus passes for their employees as is done by many universities and businesses. By doing so, departments can cut down on costs of parking infrastructure. \$ 🌐

### RAIL

Trains, monorail, and light rail take cars off the road, reducing emissions, but also reduce the need for constructing additional highways. Encouraging and subsidizing employees to use rail can save them over \$500 per month from car expenses. As an added bonus, rail riders typically have access to outlets and internet. Check with the administrative and transportation agencies about how subsidies can be provided for employees and visitors. \$ 🌐

### BIKE

Biking is not only better for the environment than driving, but better for employee and visitor health. An important incentive to riding a bike to work is having adequate and secure bicycle parking at the work site, as well as facilities for employees to change clothes and store wet gear during the rainy season. Install secure and covered bike racks to encourage employee and visitor biking. Host events like appointing every Friday “Bike to Work Day” and – if feasible – consider creating a shower and changing room in your office. Hold a raffle for visitors that bike with prizes donated from the local community. \$ 🌐🌐

#### IDEAS IN ACTION



Tri-Met's Medical Transportation Program (MTP) in Portland, OR is the primary point of access

for nonemergency transit for Medicaid participants. Because of MTP, Medicaid nonemergency trips are more frequent and saved the state of Oregon more than \$2.6 million per year.

[http://apolloalliance.org/wp-content/uploads/2009/04/aplatwenty\\_first\\_century.pdf](http://apolloalliance.org/wp-content/uploads/2009/04/aplatwenty_first_century.pdf)

### RIDE SHARING, VANPOOLING & CARPOOLING

On days or places when mass transit or biking is not an option, encourage ride sharing. Increasing occupancy from one to two people in rush hour traffic would save 40 million gallons of gas per day or 15 percent of US gas consumption. With ride sharing, everyone saves on gas, parking, emissions, stress, and where there are high-occupancy-vehicle (HOV) lanes, riders also reduce commute time. A part-time staff person can help develop guidance and forums for linking up riders. ! 🌐

### FLEET

If using the Motor Pool Fleet, check with the state to request the most efficient model available, such as a hybrid vehicle. Driving a hybrid or alternative fuel vehicle – such as biodiesel – reduces carbon emissions, saves money and sets a good example. Smart driving and maintenance of traditional vehicles can also lower your impact on the environment. 🌐

<sup>39</sup> Commuter Solutions <http://www.ltd.org/cs/index.html>



### Keep in Mind

- Offer driver training that teaches safe, healthy, and environmentally and fiscally responsible driving behavior and save \$200-500 per vehicle per year.<sup>40</sup>
- Smart driving includes nonaggressive driving, reduced braking and not leaving the vehicle idling.
- Make sure your employees know the impact of transportation on the environment and human health. Provide them with a list of driving “dos” and “don’ts”, and make sure the most efficient routes are selected. Create a page on your office intranet that lists travel tips and links to websites that generate maps of shortest routes.
- Plan fewer trips by videoconferencing or telecommuting when possible.
- Use GPS equipment in your vehicles to provide employees with the quickest routes. GPS units can also assist in auditing fleet mileage.<sup>41</sup>



*The Salem Motor Pool provides fueling for biodiesel and compressed natural gas vehicles. In 2008 the Department of Administrative Services (DAS) Statewide Fleet Administration increased the number of alternative fuel and hybrid vehicles in support of the “Greening of the Fleet” initiative to build a 34 percent alternative fuel fleet.<sup>42</sup>*

### IDEAS IN ACTION



To encourage bicycle commuting camaraderie among employees, the Bicycle Transportation

Alliance (BTA) offers an annual Bike Commute Challenge where workplaces compete to see who can bike the most during the month of September.

[www.bta4bikes.org](http://www.bta4bikes.org)

### REDUCING BUSINESS TRAVEL

Americans make more than 405 million long-distance business trips per year.<sup>43</sup> By cutting out unnecessary travel, you’ll improve employee health by reducing stress, and save both money and literally tons of carbon emissions. The alternative of teleconferencing and telecommuting described below will support reduction of travel. While some recommendations may have upfront costs, such as purchasing video conference equipment, the reductions in travel costs will be substantial and quickly make up the purchasing costs.

\$-\$\$ 🌍🌍🌍

<sup>40</sup> [www.fightglobalwarming.com/page.cfm?tagID=268](http://www.fightglobalwarming.com/page.cfm?tagID=268)

<sup>41</sup> Tips adapted from Environmental Defense Fund, Drive Smart: Fuel Savings Add Up. <http://www.fightglobalwarming.com/page.cfm?tagID=268>

<sup>42</sup> DAS 2008 Annual Environmental Performance Report <http://www.employment.oregon.gov/DAS/SSD/FLEET/docs/08EnvPerf.pdf>

<sup>43</sup> US Dept of Transportation/Bureau of Transportation Statistics. 2003. American on the Go.

Available at [www.bts.gov/publications/america\\_on\\_the\\_go/us\\_business\\_travel/pdf/entire.pdf](http://www.bts.gov/publications/america_on_the_go/us_business_travel/pdf/entire.pdf)

### Keep in Mind

- Carefully consider each flight and every trip. Could a phone or video conference replace travel?
- When possible, travel by bus, train, or a fuel-efficient car with multiple passengers.

## TELECONFERENCING & TELECOMMUTING

Teleconferencing is a cost effective, efficient way to bring together multiple people into a “virtual” meeting. In addition to conference calls, videoconferencing, webinars (used for online presentations, demonstration videos, meetings, trainings or conferences), and other internet-based collaboration tools save employee travel time, costs and emissions while offering “face to face” interaction. While high-end videoconferencing equipment can be expensive, many videoconferencing services are relatively inexpensive or even free in some cases, and it is a smart investment as savings are generated from a reduction in business trips. Telecommuting is also an efficient way to run your operations when staff members are able to work from home. The Oregon Department of Energy supports telecommuting for public employees as a way to cut down on office expenses, reduce energy waste and improve air quality by decreasing transportation emissions. [See Appendix A for sample transportation policy language].

## FOOD

**F**ood production is intrinsically linked to climate change. Not only do many conventional agricultural practices contribute to carbon emissions (7.4 percent of U.S. emissions), the manufacturing and transportation of products is instrumental in rising levels of carbon pollution.<sup>44</sup> Industrial farming relies on large expenditures of fossil fuel at all level of production and distribution, from plowing and fertilizing fields to transporting crops to storage, from processing and packaging products to the final trip to the table. Public health plays a significant role in community nutrition, food safety, and education. Understanding the links between climate change and food is important for the public health sector in order for education of both employees as well as visitors.

Foods that meet carbon reduction goals are also in line with existing public health priorities. For example, the use of sustainably produced foods may reduce health-related concerns from air-borne pesticide exposure and water contamination commonly caused by industrial agriculture practices. Additionally, foods that are less processed not only use less energy to produce, but are generally more nutritious and healthier for the individual. Agencies can help meet both climate and nutrition goals at the workplace by making changes to food purchasing policies that allow for the availability of healthy alternatives in vending machines, cafeterias, meetings, and events. [See Appendix A for sample food policy language.]

<sup>44</sup> United States Environmental Protection Agency, “2007 Draft U.S. Greenhouse Gas Inventory Report.” [epa.gov/climate-change/emissions/usinventoryreport07.html](http://epa.gov/climate-change/emissions/usinventoryreport07.html)

## Climate and agriculture

Conventional agriculture produces carbon pollution that causes climate change, and climate change in turn affects both the availability and safety of the food we eat. Shifts in temperature and precipitation affect crop yields and food production, impacting food security and nutritional shortages.<sup>45</sup> Water and foodborne infections are also likely to increase significantly in the future due to progressively severe droughts and floods.<sup>46</sup> Already, approximately 76 million people (1 in 4) in the United States experience foodborne illnesses every year.<sup>47</sup>

→ *If Oregon does not take further action to prepare for climate change, the state can expect to incur costs of \$13 million/year by 2020 in reduced food production, increasing to \$35 million by 2040 and \$153 million by 2080.<sup>48</sup>*

### IDEAS IN ACTION



The local health officers and public health administrators of the Coalition of Local Health Officials

(CLHO) include a teleconferencing option in their monthly meetings to allow for members across the state of Oregon to participate without traveling to the meeting location. Additionally, CLHO editorial board members (including representatives from state public health staff and county health departments), have the option of joining meetings via videoconferencing or conference call.

*Oregon Public Health Connection. Volume 4. No 6.*

While food protection is a primary activity of state health agencies, only half of local health departments across the country are programmatically addressing water and foodborne diseases related to climate change. Only 34 percent of local health departments nationally have programs that encourage the purchase of locally grown, organic or plant-based foods. These programs, while consistent with objectives to reduce climate-damaging emissions, are not explicitly designed with the aim of minimizing carbon emissions.<sup>49</sup> Your department can take the initiative to develop an internal food policy (educating staff, providing pamphlets to visitors), or work with the state director to develop a statewide 'low carbon' food policy.

Organic, in-season, unprocessed and local Providing sustainably grown food for staff reinforces the connection between food, health, and climate issues. However, determining what food is a good "low carbon" option is challenging. For instance, the "local food movement" or "150 mile diet" has gained considerable attention in the last few years, but recent research has found that transportation emissions are only 11 percent of the total carbon footprint of food (7 percent for farm to

45 Global food security under climate change . Schmidhuber; Josef 2007 <http://www.pnas.org/content/104/50/19703.full.pdf>; Climate Change: The Public Health Response. Frumkin et al March 2008, Vol 98, No. 3 | American Journal of Public Health

46 CDC Policy on Climate Change and Public Health

47 Climate Change and Human Health: The Public Health Response. McGehee. CDC

48 An Overview of Potential Economic Costs to Oregon of a Business-As-Usual Approach to Climate Change. Climate Leadership Initiative, EcoNorthwest. 2009

49 Are We Ready? Preparing for the Public health challenges of climate change. NACCHO, EDF, George Mason University, 2008.

store, 4 percent store to home).<sup>50</sup> However, the number cited above is for all foods; for meat, transportation counts as only 1 percent of total emissions. Therefore, the production, processing and actual product you are consuming is more important emissions-wise than where it was grown. Consider the following tips:

- Eat less processed foods (processed foods include milk, anything packaged/tinned/frozen/canned, breads, spreads, sugar, soda, etc.).
- Eat less meat and dairy.
- Eat more organic products.
- Purchase only what will be eaten, and compost scraps and leftovers.
- Purchase local fruits and vegetables when available.

There are many benefits that come with supporting local food producers, such as supporting:

- A local food economy by keeping money in the community.
- Food security for the community in case of blocked access to outside food sources.
- A connection between consumers and their food origins, possibly increasing healthy eating.

#### IDEAS IN ACTION



The Portland State Office Building has begun to compost the food scraps and waste from the café that provides breakfast and lunch service

to building occupants and visitors. Building operations saves 52 percent of the cost of putting these food scraps into the landfill, resulting in a win-win solution. Composting will also soon be made available in the break rooms on each floor of the building. Though this only began recently, it is estimated that food composting will keep at least 4800 pounds of food waste out of landfills.

To build awareness among your staff, consider holding a staff potluck, encouraging staff to bring low-carbon impact food with origins and seasonality labeled clearly. Provide handouts or a small presentation to visitors on the link between food, public health, and climate change, and when possible encourage use of WIC and food stamps at local farmer's markets.

→ *A twenty-two year study from the Rodale Institute demonstrated that conventional farming methods require 3.7 barrels of oil per hectare of crop production, while organic farming methods needed only 2.5 barrels of oil to produce the same crop yield.<sup>51</sup> In addition, soil farmed organically stores greater amounts of carbon dioxide – at least twice and up to three times as much – compared with soil farmed by conventional methods.<sup>52</sup>*

<sup>50</sup> Carnegie Mellon [http://news.mongabay.com/2008/0602-ucsc\\_liaw\\_food\\_miles.html](http://news.mongabay.com/2008/0602-ucsc_liaw_food_miles.html)

<sup>51</sup> D. Pimental et al, "Environmental, Energetic, and Economic Comparisons of Organic and Conventional Farming Systems," *Bioscience* 55(7): 573–82.

<sup>52</sup> Leopold Center for Sustainable Agriculture. "Food, Fuel, and Freeways: An Iowa Perspective on How Far Food Travels, Fuel Usage, and Greenhouse-Gas Emissions," 2001. [www.leopold.iastate.edu/pubs/staff/ppp/food\\_mil.pdf](http://www.leopold.iastate.edu/pubs/staff/ppp/food_mil.pdf)

## HEALTHY EMPLOYEES, HEALTHY CLIMATE

Encouraging a low carbon way of eating begins with an assessment of the current food options that are available at your office. Are there vending machines or a cafeteria onsite? If so, what options are currently available? Can improvements be made?

Coffee, tea and chocolate are vital staples of most office environments and they help get us through the day. When purchasing these products for the office, look for labels that indicate “fair trade”, to ensure that the people producing the food are receiving the benefits of its sale in the global market. Fair trade certification includes environmental requirements, ensuring less environmental destruction and deforestation, and therefore less contribution to greenhouse gas emissions than conventional methods.<sup>53</sup>

### IDEAS IN ACTION



The Centers for Disease Control and Prevention (CDC) launched its “Green and Healthy”

initiative to green their facilities and campuses to support environmental responsibility and health promotion. As one component of the Green and Healthy initiative, garden markets on campus make fresh produce available during the week. Food and cafeteria workgroups are developing partnerships with local farmers and joining a local food cooperative, as well as promoting healthier food options.

*The Nation's Health. The official newspaper of the American Public Health Association. April 2008*

Offering more vegetarian options will also reduce your office's climate impact. Even encouraging employees to cut one meat-based meal a week will reduce emissions and has been shown to reduce the risk of heart disease and other illnesses. Methane from cows actually has twenty-one to twenty-five times more warming potential than carbon dioxide, and 94 percent of total methane emissions from agriculture are directly related to livestock.<sup>54</sup> Large-scale meat production also often occurs in deforested areas, which can no longer sequester carbon, and the feedlots further increase demands on fossil fuels from grain production. Deep-sea fishing also requires large amounts of fossil fuels in catching, storing, and transporting fish from sea to market. In fact, while healthier for the heart, a diet rich in fish nearly equals the emissions associated with a red-meat diet.<sup>55</sup>

Processing and packaging foods is energy intensive and in an office, we are surrounded by a multitude of these products, tempting us as a quick and easy snack option during a busy workday. Most of us know that choosing whole foods, like fresh vegetables and grains, is the

healthier choice for our bodies as well as for the planet. Replacing prepackaged snacks with local and in-season whole food options in the cafeteria will make it easier for employees and visitors to make nutritious and climate-friendly lunchtime and snacking decisions. Employee food choices can set an example for the visitors that they work with and who visit your office: if employees are making “climate positive” food choices, these behaviors may carry over to the greater community.

A part-time, short-term staff person can support development of pamphlets, presentations, and other educational materials for visitors and employees. ! 🌍🌍🌍🌍

<sup>53</sup> Leopold Center for Sustainable Agriculture. “Food, Fuel, and Freeways:

<sup>54</sup> Gidon Eshel and Pamela A. Martin, “Diet, Energy, and Climate change,” *Earth Interactions* 10: 1–17, 2006.

<sup>55</sup> Fair Trade Federation, “Fair Trade Federation Members: Coffee and Food Production.” [www.fairtradefederation.org/mem-cof.html](http://www.fairtradefederation.org/mem-cof.html). Accessed on 14 September 2007.

## PURCHASING AND PRODUCTS

**P**roducts generally emit carbon emissions throughout their entire life cycle, including during feedstock extraction, transportation, production, use, and disposal of the product. More individuals and companies are beginning to demand products and services that conform to a green, more sustainable ethic to reduce emissions.<sup>56</sup> It is still essential to prevent waste throughout the product life cycle, increase product lifespan, and support carbon-neutral and carbon-reducing products. There are also possible health considerations in what equipment, products and services are purchased. This can include cleaning products and much of the equipment used in buildings. In some instances, the products, equipment and services we buy can adversely impact indoor air quality for employees and visitors/clients. Consider doing Health Impact Assessments (HIAs) for significant purchases. Often the HIA process can help identify safer alternatives. (See the Resources Section for more information).

While hospitals send millions of tons of solid and medical waste each year to landfills and incinerators, public health departments and other health providers are also substantial contributors of waste, although to a lesser extent.<sup>57</sup> Due to the environmental health dangers of medical waste, it is vital for the health sector to carefully consider the impact of purchased and disposed products. You will want to work with your procurement and purchasing departments to ensure that “green” options are offered and prioritized. They can do this by labeling items with green leaf tags to encourage individuals to select these products over conventional products as well as to make it easier for the purchaser to identify the preferred products. Your department can also influence purchasing decisions at the state level by requesting the purchase of, or more research on, ‘greener’ and ‘low carbon’ products. Let the state-level decision makers know what materials and products you think are appropriate for a public health department to purchase. You may want a staff person to do some additional research on products for the public health sector. While some ‘greener’ products may have additional upfront costs, they are often longer lasting and produce less waste, lowering your costs in the long run. A part-time, short-term staff person can support development of pamphlets, presentations, and other educational materials for visitors and employees. \$-\$\$\$ ! 🌍-🌍🌍🌍

### Low carbon purchasing

Shifting purchasing patterns can create a healthier workplace for employees and visitors by reducing human exposure to harmful substances and improving air quality.<sup>58</sup> Environmentally preferable or low carbon purchasing not only protects the environment by reducing waste, but it also reduces operating costs and is a climate-positive choice for your building. Sustainable purchasing practices include buying energy efficient, recycled, or secondhand products that have a reduced impact on human health and the environment when compared with conventional options.

When local health departments in Oregon were surveyed about specific steps they were making to reduce their emissions, 46 percent of departments responded that they have product purchasing policies (such as prioritizing reduced toxic materials and less packaging).<sup>59</sup>

56 [www.sustainablebusiness.com/index.cfm/go/news.display/id/15883](http://www.sustainablebusiness.com/index.cfm/go/news.display/id/15883)

57 [www.noharm.org/all\\_regions/issues/waste/](http://www.noharm.org/all_regions/issues/waste/)

58 [www.energystar.gov/index.cfm?c=healthcare.bus\\_healthcare](http://www.energystar.gov/index.cfm?c=healthcare.bus_healthcare)

59 [http://sustainableoregon.net/toolkit/green\\_purchasing.cfm](http://sustainableoregon.net/toolkit/green_purchasing.cfm)



To evaluate whether your purchases are sustainable, review products for their environmental, social and economic attributes (e.g. raw material acquisition, manufacturing practices, proximity of production, packaging, operation and future disposal). Consider both medical supplies as well as general office supplies. For example, a ton of 100 percent recycled paper saves the equivalent of 4,100 kWh of energy, 7,000 gallons of water, 60 pounds of air emissions, and three cubic yards of landfill space.<sup>60</sup>

### IDEAS IN ACTION



Kaiser Permanente Northwest Region in Clackamas, Oregon prioritizes reusable items

like plastic sip bottles for patients rather than disposable cups, and has an extensive recycling program. They also work with suppliers to obtain environmentally preferable supplies that conserve resources and are non-toxic, such as IV solutions bags that do not contain polyvinyl chloride (PVC). They also purchased mulching mowers that reduce the use of fertilizer and eliminate 380,000 pounds of grass clippings a year.

[www.practicegreenhealth.org/tools/library/tag/HazardousMaterials&Waste](http://www.practicegreenhealth.org/tools/library/tag/HazardousMaterials&Waste)

### When evaluating products, consider the following questions:<sup>61</sup>

- ☐ Are the products really necessary?
- ☐ Do they cause minimal adverse environmental impacts?
- ☐ Do they incorporate recycled content or reusable materials?
- ☐ Do they avoid or minimize the use of hazardous chemicals?
- ☐ Do they result in reusable or biodegradable products?
- ☐ Do they conserve energy and natural resources?
- ☐ Do they optimize renewable resources?
- ☐ Do they minimize packaging?
- ☐ Are there environmentally preferable alternatives?
- ☐ Are the products produced locally?
- ☐ Are the products easy to maintain or repair?
- ☐ What is the suppliers stated environmental commitment?

## PURCHASING EQUIPMENT AND SUPPLIES

Consider the long-term energy and fiscal savings of low carbon purchasing. Systems like outside air economizers that circulate fresh air in a building require an upfront cost, but will pay for itself in energy cost reductions in a few years. Also, old equipment can be recycled with electronic recycling organizations or with the manufacturer, often at little or no cost.

When purchasing new equipment like computer monitors or printers, look for “Energy Star®” labels. The Energy Star® label is a government rating for energy efficient equipment. If you’re looking for new office equipment, the energy savings from these purchases add up. Energy Star estimates that each dollar that a nonprofit healthcare organization saves on energy is equivalent to \$20 in new revenues for hospitals or \$10 for medical offices.<sup>62</sup> Alternatives also exist for many

<sup>60</sup> Institute for a Sustainable Environment, Climate Leadership Initiative and Coalition of Local Health Officials. Climate Change Health Preparedness in Oregon. April 2009

<sup>61</sup> Green Purchasing Best Practices Guidebook. <http://www.hkgpc.org/html/guidebook/guidebook.htm#steps2>

<sup>62</sup> City of Portland 2001

single-use items. Health Care Without Harm offers suggestions for moving away from disposable supplies when possible. See the resources sections for more information.

By sharing your environmental purchasing goals with your equipment suppliers, they can help support your climate-positive goals. Sustainable Hospitals provides a database outlining alternative supplies and equipment for the healthcare industry. See the resources section for more information.

### When making a purchase, consider the following:

- ☐ Do I need to buy this?
- ☐ Can I buy a quality product secondhand or remanufactured/refurbished? (Remanufactured products use 85 percent less energy in production.)
- ☐ Is the product available with post-consumer recycled materials? (Purchasing these products saves energy and raw materials, and ensures that the recycling industry will continue by sustaining a market for recycled items.)
- ☐ Is it reusable?
- ☐ Is it durable and repairable? For example: Can I replace appliance parts?
- ☐ Does it contain toxic substances? (Many toxic materials are petroleum-based and result in carbon emissions.)
- ☐ Can I avoid excessive packaging? If not, can the package be composted or at least recycled?

Establishing a climate-positive purchasing policy that defines your office's priorities and goals is an effective way to institutionalize new internal purchasing patterns. Appendix A provides text for a purchasing policy that can be modified based on your workplace's purchasing needs and activities.

Organizing a committee to evaluate purchasing decisions is also important for maintaining a commitment to climate-positive purchasing among employees.

### The following are tips on how to incorporate new purchasing priorities in your workplace:

- ☐ Start a Green Team. Teams spread the work around and build support for the effort. Seek out committed individuals who are interested in efforts to make their workplace more environmentally sustainable.
- ☐ Review what other agencies (either public health or other county agencies) have done and look for examples that can easily be adopted by your agency through a simple product or specification change, i.e. recycled content products.
- ☐ Have buyers and project managers learn what makes a product or service green and what resources are available to learn more. Also convey the benefit of "going green".
- ☐ Consider formalizing green purchasing practices by developing a written policy (see Appendix A). Find champions in management and elected officials to promote the policy.
- ☐ Track, quantify, and celebrate successful green purchases.
- ☐ Keep looking for new opportunities in solicitations and purchases. Engage in "green" government/business networks or keep updated through various green/procurement publications.

From: [http://sustainableoregon.net/toolkit/green\\_purchasing.cfm](http://sustainableoregon.net/toolkit/green_purchasing.cfm)



## WASTE

Every year the world digs up, manufactures, consumes, and then throws away over one-half of a trillion tons of material. Although industrialized nations are recycling more waste than ever before, we are also creating more waste per capita each year.<sup>63</sup> On top of that, more than 55 percent of our waste is still sent to the landfill.<sup>64</sup> The inefficient processes we use during manufacturing, mining, oil and gas exploration, agriculture and coal combustion result in the production of 71 tons of waste produced for every ton of municipal trash. “Waste” includes materials that are thrown away, recycled, or composted. Products are responsible for carbon emissions at nearly every phase of their life, from resource extraction to production, distribution, consumption, and disposal.<sup>65</sup>

### IDEAS IN ACTION



The North Central Public Health District in Dallas, Oregon has reduced their office's climate impact by

organizing a “Green Team” consisting of front office, nursing, environmental health and management staff. The team's activities included implementing new recycling, energy-efficiency, waste reduction and purchasing practices, such as purchasing rechargeable batteries. Green Team members provide an orientation to new employees to familiarize them with the department's efforts.

Oregon Public Health Connection, March 2009, the Oregon Public Health Division and the Conference of Local Health Officials (CLHO).

Climate and health impacts of waste

Nearly everything we send to a landfill generates methane during the decomposition process, and on top of that a number of these discarded products are replaced with new products. The end result, of course, is that even more emission-intensive extraction occurs in the pursuit of more raw materials.<sup>66</sup> Electronic waste – known as “e-waste” – is particularly harmful to the environment and human health as it pollutes landfills and can even enter the water table if not properly managed.<sup>67</sup> We can, however, shift our product usage and waste disposal methods at the office to include efforts to reduce, re-use, recycle, and compost.



*According to the United Nations System-Wide Earthwatch Initiative, industrialized countries account for only 20 percent of the world population, but consume 86 percent of aluminum, 81 percent of paper, 80 percent of iron and steel, and 76 percent of timber produced globally.<sup>68</sup>*

In Lane County, Oregon, paper is the greatest product in the landfills (21 percent), followed by food waste (16 percent).<sup>69</sup> Both of these products are recyclable and compostable. This section will provide an overview and tips on how your health facility can reduce its contribution these – and other products – make to the landfill.

63 [www.deq.state.or.us/lq/sw/twopercent/reducepercapita.htm](http://www.deq.state.or.us/lq/sw/twopercent/reducepercapita.htm)

64 [www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/landfiller.html](http://www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/landfiller.html)

65 [www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/landfiller.html](http://www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/landfiller.html)

66 Platt, Brenda and Eric Lombardi. “Stop Trashing the Climate.” BioCycle August 2008, Vol. 49, No. 8, p.24 The full report, Stop Trashing the Climate, can be downloaded at [www.stoptrashingthecclimate.org](http://www.stoptrashingthecclimate.org)

67 [www.griffith.edu.au/engineering-information-technology/centre-wireless-monitoring-applications/research/circuits-in-plastic/e-waste-problem-environmental-pollution-health-implications](http://www.griffith.edu.au/engineering-information-technology/centre-wireless-monitoring-applications/research/circuits-in-plastic/e-waste-problem-environmental-pollution-health-implications)

68 United Nations Environmental Programme Earthwatch <http://earthwatch.unep.net/solidwaste/wastedisposal.php>

69 [www.lanecounty.org/PW\\_WMD\\_Recycle/documents/Brochures/UPDATED08Recyclers\\_Guide2bWEB.pdf](http://www.lanecounty.org/PW_WMD_Recycle/documents/Brochures/UPDATED08Recyclers_Guide2bWEB.pdf)

## Waste at the workplace

The first step to climate-positive waste disposal practices is to begin with an assessment of your current consumption and disposal activities. Next, identify goals for your department or organization and outline the intermediary steps needed to achieve that ideal future of less waste. Conducting a “waste sort” is a useful way to gauge a department’s waste stream. A waste sort involves collecting, measuring, and evaluating a representative sample of the waste generated in your department. Categories of waste to consider include paper, plastic, glass, metal, and food scraps. The EPA provides a waste sort worksheet and instructions that can assist with the process at [http://wastewise.tms.icfi.com/plan/waste\\_sort.htm](http://wastewise.tms.icfi.com/plan/waste_sort.htm).

To conduct your waste assessment, you can bring in an expert, or appoint a team of staff members to look at current waste problems, janitorial issues, internal and external recycling systems, and all other relevant factors involving your office’s waste stream. Identify where your recycling bins are located (in each office, or do staff have to walk down the hall?), check your facilities or building manager to see if more can be recycled than is currently (e.g. food scraps?), and go dumpster diving to see if staff need to be more educated on proper recycling behavior! Waste reduction can save money and reduce your impact on the environment.<sup>70</sup> A part-time, short-term staff person can support development of pamphlets, presentations, and other educational materials for visitors and employees on waste reduction. See Appendix A for sample waste reduction policy language.

➡ *A survey conducted by the Climate Leadership Initiative and the Oregon Coalition of Local Health Officials of Oregon public health workers found that 31 percent of health departments had developed policies for reducing waste generation as part of procedures or policies for reducing their contribution to climate change.<sup>71</sup>*

## Medical Waste

For health facilities that provide on-site patient care, medical waste poses an additional challenge when considering environmentally preferable practices. The EPA defines medical waste as “all waste materials generated at health care facilities, such as hospitals, clinics, physician’s offices, dental practices, blood banks, and veterinary hospitals/clinics, as well as medical research facilities and laboratories.”<sup>72</sup> More than 90 percent of potentially infectious medical waste is incinerated<sup>73</sup> and medical waste incinerators are a large source of environmental pollutants.<sup>74</sup> Pharmaceutical waste (from intravenous preparation, partially used vials, syringes, or outdated pharmaceuticals) is another challenge for health facilities as these products are often discarded down the drain or end up at a landfill.<sup>75</sup>

70 [www.wastereduction.org/](http://www.wastereduction.org/)

71 Institute for a Sustainable Environment, Climate Leadership Initiative and Coalition of Local Health Officials. Climate Change Health Preparedness in Oregon. April 2009

72 [www.epa.gov/waste/nonhaz/industrial/medical/mwfaq.htm](http://www.epa.gov/waste/nonhaz/industrial/medical/mwfaq.htm)

73 [www.epa.gov/waste/nonhaz/industrial/medical/index.htm](http://www.epa.gov/waste/nonhaz/industrial/medical/index.htm)

74 [www.secondnature.org/pdf/snwritings/factsheets/green\\_hosp.pdf](http://www.secondnature.org/pdf/snwritings/factsheets/green_hosp.pdf)

75 Managing Pharmaceutical Waste A 10-Step Blueprint for Healthcare Facilities In the United States. Proactive Green Health, August 2008

Reducing the waste stream and toxic releases of medical facilities is an important step toward a healthier environment. **Health Care Without Harm recommends the following strategy for minimizing hospital waste with the aim of protecting people, the environment, and saving money:**

## 1. SEGREGATION

Separating different types of waste at the point of generation and keeping them isolated from each other. By doing this, appropriate resource recovery and recycling techniques can be applied to each separate waste stream. The amounts of infectious waste, hazardous waste and low-level radioactive waste that must be treated according to special (and usually costly) requirements are minimized. ! 🌍🌍

## 2. SOURCE REDUCTION

Minimizing or eliminating the generation of waste at the source itself through techniques such as product substitution, technology change and good operating practices. Through purchasing and product substitution, toxicity of waste can also be reduced. 🚫 🌍🌍

## 3. RESOURCE RECOVERY AND RECYCLING

Recovery and reuse of materials from the waste stream. The majority of waste from health care facilities is surprisingly similar to that of an office building or hotel: paper, cardboard and food waste. Hospitals can implement fairly simple programs that divert these materials from the solid waste stream, lowering disposal costs.<sup>76</sup> ! 🌍🌍

## Reduce

One of the simplest and most effective ways to eliminate waste is to curb consumption and ensure that products you use are long-lasting, reused, or recycled.

**Specific actions that your office can take to reduce waste include:**

- ☐ Order items in bulk and request reduced or reusable packaging from manufacturers. 🚫 🌍
- ☐ Reuse foam packaging “peanuts” and cardboard boxes. 🚫 🌍
- ☐ Invest in equipment that helps reduce waste, such as repairable equipment, copiers that have a double-sided option, and rechargeable batteries. \$\$ 🌍
- ☐ Use email rather than printing hard copies (e.g. a hospital in Portland, OR saves \$9,200 and 175,000 pages of paper – 20 trees! – a year by not printing daily financial reports to departments). 🚫 🌍
- ☐ Prune mailing lists – both incoming and outgoing – and move to electronic mailings. ! 🌍
- ☐ Utilize reusable rather than disposable products, including within your break room (e.g. dishes, mugs, utensils, water glasses) or when hosting events or meetings. \$ 🌍

### IDEAS IN ACTION



McKenzie-Willamette Medical Center in Springfield, OR estimates that they have saved between \$10,000 and \$50,000 over

the past five years by selling their used cardboard to Weyerhaeuser.

[www.eugene-or.gov/portal/server.pt/gateway/PTARGS\\_0\\_235\\_266548\\_0\\_0\\_18/SBI%20Report.pdf](http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_235_266548_0_0_18/SBI%20Report.pdf)

76 [www.clackamas.us/transportation/recycling/preventioncom.jsp](http://www.clackamas.us/transportation/recycling/preventioncom.jsp)

- ❑ Consider asking employees to bring in and use their own reusable cups, dishes and utensils, if the office cannot provide it. 🌍
- ❑ Minimize mis-prints by posting a diagram on how to load special paper such as letterhead so that it will be printed correctly. 🌍
- ❑ Save paper and space in your office by using or creating a central filing system instead of maintaining duplicate personal files. 🌍
- ❑ Promote recycling to all employees: make a poster or label that lists or even shows what can and can't be recycled. 🌍

IDEAS IN ACTION



Legacy Health Systems in Oregon replaced disposable mattresses with reusable mattresses, resulting in a savings of \$81,527 and 16,350 pounds of waste per year.

[www.eugene-or.gov/portal/server.pt/gateway/PTARGS\\_0\\_235\\_266548\\_0\\_0\\_18/SBI%20Report.pdf](http://www.eugene-or.gov/portal/server.pt/gateway/PTARGS_0_235_266548_0_0_18/SBI%20Report.pdf)

## Reuse

Reusing products – whether in the same form or as a new product – lowers purchasing costs, waste, and emissions associated with the generation of new products. Many byproducts that would normally be considered waste, such as industrial grade chemicals, office paper and packaging cardboard, can be utilized within your own business or by others, often in completely different industries. When your office is looking to buy, consider refurbished items – such as refillable ink cartridges and office furniture or equipment – to reduce the need for manufacturing new items. 🌍🌍

## Recycle

Recycling has gained widespread recognition and prevalence in the last two decades, and it continues to grow. The most important step in establishing an effective recycling program is identifying materials that are commonly discarded, and developing a system to separate what might otherwise be waste. While recycling saves energy and natural resources, it still is energy demanding (transportation to facilities and processing) and should be done as a last step after reducing and reusing items.

A ton of 100 percent recycled paper saves the equivalent of 4,100 kWh of energy, 7,000 gallons of water, 60 pounds of air emissions, and three cubic yards of landfill space.<sup>77</sup>

<sup>77</sup> City of Portland, Office of Sustainable Development. Green Office Guide. Available at: [www.portlandonline.com/shared/cfm/image.cfm?id=111253](http://www.portlandonline.com/shared/cfm/image.cfm?id=111253)

## To boost recycling at your business, consider taking the following steps:

- ☐ Assess what is already being recycled and what can be recycled in your area. ♻️
- ☐ For materials that are not being recycled, contact your waste hauler to see which items can be added to your service for recycling. ♻️
- ☐ Reduce the number and size of garbage containers making it more difficult to throw items away. 🌍
- ☐ Set recycling and composting (if food composting is available in your area) bins next to garbage containers to make it easier to recycle. 🌍
- ☐ Educate staff on what items can be recycled or composted and post notices next to bins. ♻️ 🌍
- ☐ Purchase items that can be recycled or taken back to the manufacturer. \$ 🌍
- ☐ Consider purchasing products with recycled content in order to close the loop by providing a market for recycled products. \$ 🌍
- ☐ Recycle and purchase remanufactured toner and printer cartridges at local printing stores or nationwide stores that offer these services and products. \$ 🌍
- ☐ Recycle electronics that are no longer in use. 🗑️ 🌍 🌍

➡️ *Oregon statute includes a waste management hierarchy, which states that the preferred order for managing wastes are prevention, followed by reuse, followed by recycling, then composting, then energy recovery, and finally landfilling as the least preferred option. Oregon has a waste recovery goal of 50 percent in 2009 and is planning for no increase in total waste generation in subsequent years.<sup>78</sup>*

## Steps to creating a zero waste office

### Planning and Preparation

- ⇒ Study the waste stream and associated costs
- ⇒ Develop a waste reduction proposal and gain the support of management
- ⇒ Assess employees' interest and encourage their support

### Laying the Foundation

- ⇒ Select a waste reduction coordinator
- ⇒ Set goals
- ⇒ Decide on waste reduction measures, procurement policies, and what will be reduced, recycled, or reused
- ⇒ Locate markets for waste materials, or select a recycling service
- ⇒ Identify sources of recycled products
- ⇒ Design a waste collection and storage system

### Getting the Program Online

- ⇒ Educate your staff and provide reminders during staff meetings and in staff emails
- ⇒ Promote and implement the program
- ⇒ Establish monitoring and evaluation procedures and report progress towards goals
- ⇒ Celebrate with “no waste” events when goals are met

From: <http://www.bae.ncsu.edu/topic/vermicomposting/pubs/ag473-10.html>

<sup>78</sup> [www.deq.state.or.us/lq/pubs/docs/sw/Number09Materials.pdf](http://www.deq.state.or.us/lq/pubs/docs/sw/Number09Materials.pdf)

Creating a zero waste office may have some upfront costs (assessment of waste stream, development of proposal, goal setting, and getting buy-in at the state level), but long-term savings will be felt in significant reductions in waste disposal expenses. \$\$ !!!!! 🌍🌍🌍🌍

## WATER USE

**A**s temperatures rise in the coming years, fresh water could become the single most important natural resource on Earth. In 2003, the United States General Accounting Office (GAO) reported that, even under normal weather conditions, at least 36 states anticipated local, regional, or statewide water shortages within ten years.<sup>79</sup> Many municipalities across the country are already experiencing water shortages and are instituting water use restrictions. Cities as diverse as Denver, Las Vegas, St. Louis, and New York have mandatory seasonal or year round residential water use restrictions.

Water is one of the areas that will be affected most by climate change in the Pacific Northwest. It may seem that Oregon has an abundance of available water; however, the majority of Oregon's more than 100,000 miles of rivers and streams are maintained by snowfall and snowmelt, which are sensitive to changes in climate. Less snow in the winter and an earlier snowmelt in spring can affect water management due to limited storage capabilities, making water less available during warmer seasons when demand is heightened.<sup>80</sup> Changing precipitation patterns will result in flooding in some areas and drought in others, disrupting food production and transportation.<sup>81</sup> Moreover, as the global population grows, our demand for water is stressing water supplies and distribution systems, creating threats to our health, economy, and environment.

### Impacts on Health

Higher temperatures and changes in precipitation could have detrimental impacts on Oregon's supply and quality of water, which in turn can affect human health. Severe flooding in particular poses a severe risk to health through accidental injuries and chronic psychological and medical problems following the disaster.<sup>82</sup> Flooding can lead to stormwater discharge of contaminants including agricultural pesticides, industrial chemicals, sewage, and saltwater from rising sea levels.<sup>83</sup> Bacteria (e.g. salmonella and shigella), viruses (e.g. rotavirus) and parasites (e.g. cryptosporidium and cyclospora) in the water supply can lead to waterborne illnesses, which are particularly debilitating for children and the elderly.<sup>84</sup>

A survey conducted by the Climate Leadership Initiative and the Oregon Coalition of Local Health Officials of Oregon public health workers found that 65 percent of health departments in Oregon list water supply quality as one of their regulatory responsibilities. When asked about the impact of climate change on local public health, 47 percent of respondents expected extreme heat mortality and drought to be a major threat, while 50 percent expected increased frequency and severity of

79 U.S. Government Accountability Office, Freshwater Supply: States View of How Federal Agencies Could Help Them Meet the Challenges of Expected Shortages. <http://www.gao.gov/products/GAO-03-514>

80 Degrees of Danger Health Effects of Climate Change and Energy in Oregon. Physicians for Social Responsibility February 2002

81 The Intergovernmental Panel on Climate Change (IPCC). <http://www.ipcc.ch/index.htm>

82 Degrees of Danger Health Effects of Climate Change and Energy in Oregon. Physicians for Social Responsibility February 2002

83 Climate Change and Waterborne Disease Risk in the Great Lakes Region of the U.S. Jonathan A. Patz, MD, MPH, Stephen J. Vavrus, PhD, Christopher K. Uejio, MA, Sandra L. McLellan, PhD *Am J Prev Med* 2008;35(5)

84 Physicians for Social Responsibility 2002

water-borne illness to threaten their county.<sup>85</sup> Additionally, an Environmental Defense Fund survey of local health departments from around the country found that 63 percent of respondents believed that climate change had already reduced water quality or quantity in their jurisdiction and that these impacts would become more severe over the next 20 years. These changes pose the greatest health risks for people living in regions that already have marginal water supplies or are prone to flooding.<sup>86</sup>

Water conservation presents us with an opportunity to both prepare for the impacts of climate change and reduce our own impact on the climate. Cutting down on water use also cuts costs. Water use requires energy for pumping and filtration, and by reducing water consumption you will save on utility bills and reduce emissions generated through the distribution and treatment of water. Moreover, reductions in electric or gas-heated hot water use will save energy and money used for heating that water. In addition, by reducing water use and lowering emissions through better water practices and other measures, your department will conserve the water supply that may be needed to protect the community's health. The first step is to evaluate how much of your workplace's current water can be scaled back. The United States Green Building Council (USGBC) found that buildings in the United States account for 12 percent of potable water consumption.<sup>87</sup> Consider that the average American uses 159 gallons of water each day when more than half the world's population lives on 25 gallons a day.<sup>88</sup>

**Many of the suggestions for water use reduction below can be implemented without going through the state; others, such as those dealing with landscape, may need to be approved at a higher level.**

- ☐ Avoid bottled water when safe alternatives exist. Instead of providing visitors with bottled water, use water coolers with compostable cups. \$ 🌍
- ☐ Educate staff about reducing water consumption in bathrooms and kitchens. ! 🌍
- ☐ Consider installing low flow toilets, faucets, showers, and waterless urinals. \$\$ 🌍
- ☐ Install grey water reuse or rainwater catchments systems for toilet flushing and irrigation. \$\$ 🌍
- ☐ Use a storm water design that reduces impervious cover and increases on-site infiltration to decrease the need for pumping and filtering water. \$\$ 🌍
- ☐ Consider water-efficient systems such as drip irrigation on your landscape. \$\$ 🌍
- ☐ Plant native or low-water consuming plants or grasses that require less watering. If you are working with a landscape company, ask them to take up climate friendly practices. \$ 🌍
- ☐ Consider installing solar water heaters (SWHs), for which incentives can usually be obtained from your utility provider and low-interest loans can be acquired from the Oregon Department of Energy. These systems can be installed on almost any type of building. \$\$ 🌍🌍
- ☐ Stop leaks: Cold water leaks cost you money in water and sewer fees. Hot water leaks are even more costly, since you not only pay for the lost water, but also for the electricity or gas to heat its replacement. Replace washers in faucets to prevent and repair leaks. 🌍

85 Institute for a Sustainable Environment, Climate Leadership Initiative and Coalition of Local Health Officials. Climate Change Health Preparedness in Oregon. April 2009

86 Are We Ready? Preparing for the Public Health Challenges of Climate Change. NACCHO, EDF, George Mason. 2008

87 "Green Building Research" <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1718>

88 Global Environmental Change: What Can Health Care Providers and the Environmental Health Community Do About It Now? Brian S. Schwartz, Cindy Parker, Thomas A. Glass, and Howard Hu, VOL 14, NUM 12 December 2006 • Environmental Health Perspectives



## CONCLUSIONS

### OUTREACH

It is a common misperception that climate change affects only plants and animals. In fact, shifts in weather patterns are increasing the incidence of droughts, floods, and storms. These changes are altering the very systems upon which we rely. Public health agencies and organizations are in a good position to communicate with the public about climate change and the subsequent risks to human health caused by an increasing amount of greenhouse gases in the atmosphere.

While it is important for the public to understand that climate change contributes to increased morbidity, it is also vital to communicate how individuals can safeguard their health and lessen their own contribution to the problem. Messages about climate change that focus solely on the disastrous impacts can frighten people and leave them feeling fatalistic or unsure about possible solutions. By balancing a discussion of the health implications of climate change with a clear sense of how individuals can begin to shift their own behavior, your community will be better equipped to mitigate their impact and prepare for future changes.

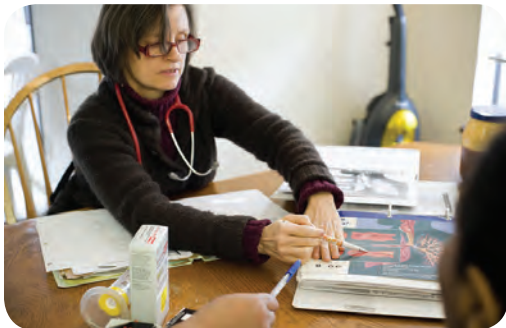


Photo Credit: Leah Nash

You can approach interactions with visitors (whether in person, online, or through print materials) as an opportunity to communicate with the public about the connections between climate change and human health. You can also demonstrate your commitment to a healthy future by showing how your workplace is lessening its own climate impact. Tips for communicating with the public about climate change/global warming include the following:

- ❑ **Make climate change visible.** Assess your online and print communications materials to see if and/or how climate change is addressed. Are there explicit connections drawn between climate change and human health?
- ❑ **Show how climate change affects our day-to-day lives.** Expand the issue of climate change beyond plants and animals and convey the broader picture that climate change directly affects humans through food production, water supplies and our health.

**Sample Language:** “Weather patterns affect just about everything in our lives – the ability to grow the food we eat, the kinds of infectious diseases and pests that can thrive in our region and affect our health, the amount of water we have for drinking and maintaining our property, and our experiences in keeping our homes and families safe from extreme weather.”<sup>89</sup>

<sup>89</sup> Climate Crossroads: A Research-Based Framing Guide. 2009. [www.thesocialcapitalproject.org](http://www.thesocialcapitalproject.org)



- ❑ **Explain how climate change is affecting human health.** Climate change is increasing the frequency of droughts, floods, and storms, which will continue to pose a threat to our health.

Sample Language: “The World Health Organization estimates that climate change will increase the frequency of heat waves, increase the changes of coastal flooding, compromise the supply of freshwater, increase the risks of waterborne disease, decrease the production of staple foods, increase the risk of malnutrition, and lengthen the transmission seasons of vector-borne diseases.”<sup>90</sup>

- ❑ **Think local.** Consider the health problems endemic to your area that have the risk of increasing due to changes in the climate. Include specific examples of how climate change affects your community and how your department’s strategies address these hazards.
- ❑ **Focus on promoting the connection between healthy people and a healthy planet.** Include examples of what people can do to safeguard their health and lessen their impact on the climate, such as carpooling or biking to work, and eating locally grown organic produce.
- ❑ **Lead by example.** Promote your facilities’ own efforts to reduce emissions in order to set a positive example as leaders in climate change awareness and action.

➔ *“Those of us working in public health should recognize that climate disruption affects promoting good health for us all. There is an opportunity now for us to lead by example and take some responsibility for the impact on the Earth’s climate.” -Dr. Mel Kohn, Acting Director of the Oregon Public Health Division, Department of Human Services, and State Health Officer<sup>91</sup>*

## COLLABORATION

**P**ublic health agencies are already collaborating with huge network of organizations and agencies in their communities. In Oregon alone, county public health departments work with a diverse array of government, nonprofit, and institutional entities including Department of Environmental Quality, Economic and Community Development, Watershed Councils, Emergency Management, US Forest Service, University Extension Office, Department of Energy, Health Care Systems, Environmental Protection Agency, Department of Agriculture, Public Works, State Drinking Water, Water Resources, Sheriff’s Office, etc. This range of partnerships provides extended opportunities for both reducing harmful carbon emissions and preparing for the impacts of climate change, allowing public health departments to think outside the box and develop innovative strategies for improving the health of the staff and community as well as reducing emissions.

<sup>90</sup> World Health Organization: Climate and Health. <http://www.who.int/mediacentre/factsheets/fs266/en/>

<sup>91</sup> Northwest Public Health Fall/Winter 2008 [www.nwpublichealth.org](http://www.nwpublichealth.org)

## **Integrating these activities into your existing systems**

Public Health Departments are not independent agencies, as they must comply with state regulations and operate within a much larger organization, often a decision-maker. While making substantial changes to operations may be challenging without approval at the state level, we have attempted to focus this manual on internal changes that can be done, without having to seek permission higher up the chain. However, the actions that your department takes may also influence higher-up decision makers, providing an example of changes that could be implemented across state agencies. We have also attempted to highlight initiatives and processes that may be influential for other departments and agencies.

The Oregon State Public Health Division is working with the Department of Administrative Services at the state level to consider changes and improvements that can be made in the operation of the Portland State Office Building. Given that the Division shares the building with other tenants, they have developed a “green team” with representation from all tenants. Through support of the green team, the Public Health Division has provided suggestions on ways to change how energy and lighting are used in the building, provide safe bicycle parking for employees, and set up composting of food. Cost savings (for waste and energy) – as well as environmental improvements – have been demonstrated.

Many of the activities recommended in this document can be implemented with little strain on staff or resources. However, to ensure that activities are carried through and that each agency has a ‘go to’ person, we recommend that a half to full-time staff member be assigned to climate change mitigation and preparedness activities. This position, ideally supported by a team, would perform tasks such as developing and distributing educational materials, researching alternative products, and communicating recommendations and requests to the state. The individual could be a new hire or a reallocation of staff working on (for example) Community Health, Communicable Disease, Emergency Preparedness, or Environmental Health programs. Public health departments can connect with state and national health and environmental health organizations to discuss partnerships to creatively fund these efforts, such as the Environmental Protection Agency, Centers for Disease Control and Prevention, Association of State and Territorial Health Officials, American Public Health Association, National Institute of Health, National Association of County and City Health Officials and other state, federal and private funding institutions.

## RESOURCES

### Public Health

Centers for Disease Control and Prevention

Information on the impact of climate change on public health.

<http://www.cdc.gov/ClimateChange/>

Climate and Health Council

An organization of health professionals mobilizing action on climate change and human health.

<http://www.climateandhealth.org/>

Health Care without Harm Purchasing Suggestions

Health Care Without Harm offers suggestions for moving away from disposable supplies when possible. [http://www.noharm.org/us\\_canada/issues/purchasing/goals.php](http://www.noharm.org/us_canada/issues/purchasing/goals.php)

Health Impact Assessments

Used to evaluate objectively the potential health effects of a project or policy before it is built or implemented.

<http://www.cdc.gov/healthyplaces/hia.htm>

Northwest Public Health

Provides a forum for practitioners, teachers, researchers, and policy makers in public health.

<http://www.nwpublichealth.org/>

Sustainable Hospitals

Sustainable Hospitals provides a database outlining alternative supplies and equipment for the healthcare industry. <http://www.sustainablehospitals.org>

Trust for America's Health

A non-profit, non-partisan organization dedicated to saving lives by protecting the health of every community and working to make disease prevention a national priority. They developed an assessment and report on climate change and public health preparedness in the US.

<http://healthyamericans.org/reports/environment/>

World Health Organization

An overview of the connection between climate change and hazards to human health.

<http://www.who.int/globalchange/climate/en/>

## General

California Integrated Waste Management Board

Sector specific information and resources on waste reduction.

Website: <http://www.ciwmb.ca.gov/BizWaste/FactSheets/>

Climate Crisis Coalition: Climate change news feed [www.climatecrisiscoalition.org](http://www.climatecrisiscoalition.org)

Energy Efficiency and Renewable Energy Network

The Energy Efficiency and Renewable Energy Network (EREN) is a program managed by the US Department of Energy (DOE). The EREN website addresses technologies such as lighting, water heating, and office equipment. It has information on energy audits, building codes, and landscaping for energy efficiency.

Website: [www.eren.doe.gov/EE](http://www.eren.doe.gov/EE)

Energy Information Administration

Energy statistics for the United States.

Website: [www.eia.doe.gov](http://www.eia.doe.gov)

Environmental Protection Agency. Glossary of Climate Change Terms.

<http://www.epa.gov/climatechange/glossary.html>

Intergovernmental Panel on Climate Change (IPCC), 2007. Fourth Assessment Report

<http://www.ipcc.ch/>

U.S. Department of Energy Sites on Renewable Energy

Solar Energy Technologies Program: <http://www1.eere.energy.gov/solar/>

Wind and Hydropower: <http://www1.eere.energy.gov/windandhydro/>

Geothermal: [www1.eere.energy.gov/geothermal/gpw/index.html](http://www1.eere.energy.gov/geothermal/gpw/index.html)

Biomass: [www1.eere.energy.gov/biomass/index.html](http://www1.eere.energy.gov/biomass/index.html)

U.S. Environmental Protection Agency.

Information on waste reduction, resource conservation, and disposal of hazardous wastes.

Website: <http://www.epa.gov/osw/>

U.S. Environmental Protection Agency Climate Leaders Inventory Guidance

Detailed and comprehensive summary of how to conduct an inventory.

Website: [www.epa.gov/climateleaders/resources/inventory-guidance.html](http://www.epa.gov/climateleaders/resources/inventory-guidance.html)

Zero Waste Alliance

Non-profit partnership supporting organizations in developing and applying Zero Waste strategies.

<http://www.zerowaste.org/>

## Oregon

### BRING Recycling

Non-profit recycling center that provides conservation education and programming. They take electronic waste (computers, televisions, copiers, etc) mostly for free (charges for some items occur due to the handling hazards). Donations are tax deductible.

Website: <http://www.bringrecycling.org/>.

### Cascadia Green Building Council

Fact sheets, links and case studies on green building.

<http://www.cascadiagbc.org/>

### Energy Trust of Oregon

Energy Trust of Oregon is an independent nonprofit organization dedicated to helping Oregonians benefit from saving energy and tapping renewable resources. Energy Trust can help with cash incentives, technical assistance, finding a contractor, installation and renewable energy solutions like solar electric, solar water heating and more.

<http://energytrust.org/public-sector/>

### Materials Exchange Center for Community Arts.

Material reuse hub, focusing on educational and artistic outlets.

Website: <http://www.materials-exchange.org/>.

### NextStep Recycling.

Recycles computer hardware and other electronics, and provides educational outreach.

Website: <http://www.nextsteprecycling.org/>.

### Oregon Bicycle Resources:

- o The City of Eugene website contains bike maps and resources for biking in Eugene. [www.eugene-or.gov/bicycle](http://www.eugene-or.gov/bicycle)

- o The Center for Appropriate Transportation (CAT) is a nonprofit organization that provides Pedalers

Express delivery service, education and youth programs, Oregon Cycling magazine, and more. [www.catoregon.org](http://www.catoregon.org)

- o The Oregon Department of Transportation (ODOT) website includes links to the Oregon Bicycle Manual and information on laws and regulations and a list of bike travel web resources. <http://www.oregon.gov/ODOT/HWY/BIKEPED/>

### Oregon Department of Energy, Conservation Division

Energy saving tips, information on incentives and renewables for businesses.

Website: [www.oregon.gov/energy/cons](http://www.oregon.gov/energy/cons)

### Oregon Department of Environmental Quality (DEQ)

Website: <http://www.deq.state.or.us/lq/sw/>.

Oregon Governor's Advisory Group on Global Warming  
Briefing paper on the connection between global warming and materials/waste.  
Available at: <http://www.deq.state.or.us/lq/pubs/docs/sw/Number09Materials.pdf>

Oregon Green Building and Solar Energy Resources  
Website: <http://www.oregon.gov/ENERGY/RENEW/Solar/Tour/docs/G-SMag87.pdf>  
[http://www.oregon.gov/OHCS/DO\\_GreenBuilding.shtml](http://www.oregon.gov/OHCS/DO_GreenBuilding.shtml)

Oregon Utilities  
Links to websites for utility companies in Oregon.  
Website: [www.oregon.gov/ENERGY/Power.shtml/shtml](http://www.oregon.gov/ENERGY/Power.shtml/shtml)

Public Building Energy Assessment  
For public building energy assessment and information on loans, contact Kathy Estes at (503) 378-4040 in Salem or 1-800-221-8035 statewide. More information on Oregon DOE programs for public buildings: <http://www.oregon.gov/ENERGY/CONS/GOV/govhme.shtml>

Rideshare  
Rideshare for the Eugene Springfield area  
[www.commutersolutions.ltd.org](http://www.commutersolutions.ltd.org)

## APPENDIX

### Sample Policy Language

#### Sample Purchasing Policy for Environmentally Preferable Products

##### I. POLICY

As part of ongoing efforts to make [your city] a healthier place to live, work and do business, [your department/organization] will work to the extent possible to purchase equipment or materials that are recyclable, made of recycled content, and reduce waste.

##### II. PURPOSE

To provide guidelines for purchasing activities to maximize the purchase of recycled content products that are recyclable and reduce waste, where performance will not be compromised.

In complying with this, [your department/organization] will request that suppliers specify whether there is an alternative product that has recycled content or is recyclable that could be substituted.

##### III. GUIDELINES

###### A. Responsibilities

###### 1. Purchasing Department

In an effort to minimize waste, staff involved in purchasing decisions shall adhere to the guidelines set forth in this policy when making purchasing decisions. The Purchasing Department will participate in establishing goals to increase the number of recyclable products or products that are made of recycled content used by [your department/organization].

###### 2. Department Managers and End Users

Individuals in all departments must work with purchasing to evaluate the feasibility of recyclable products, products that are made of recycled content and products that reduce waste in application.

###### B. Purchasing Guidelines

###### 1. Establish a waste minimization policy with vendors.

Whenever possible the use of equipment and products that are recyclable, made of recycled content and/or reduce waste should be maximized. These products should be purchased whenever such alternatives exist and performance is not compromised.

Vendors should be contacted and provided information regarding [your department/organization]'s waste minimization goals.

###### 2. Select those vendors who are willing to meet waste minimization goals.

Purchasing agents shall request from vendors information relating to recycled content and recyclability of products and equipment, and the opportunities these items offer to prevent waste. Purchasing agents will then develop a preferred list of vendors based on those who are willing to help provide such alternatives.

*From: City of Portland Bureau of Planning and Sustainability<sup>92</sup>*

92 [www.portlandonline.com/bps/index.cfm?c=28534&a=110237](http://www.portlandonline.com/bps/index.cfm?c=28534&a=110237)



## Sample Food Policy Guidelines

When providing food at meetings and events, assure that healthy food and beverages with a low-climate impact are provided. Consider the following:

- ☐ Offer locally grown products when available
- ☐ Employees responsible for decisions on food served at meetings are encouraged to maintain a list of “preferred” caterers and restaurants who provide healthy, locally-produced foods
- ☐ Ensure vegetarian fare is available
- ☐ Offer organic products when feasible
- ☐ Provide nutrition facts and sourcing labels whenever possible, Information about where the food was grown or produced will lead to interesting and educational conversations amongst attendees.
- ☐ Provide pitchers of water rather than bottles
- ☐ Encourage staff to bring glasses, cups, plates, and utensils or use re-useable products or purchase re-usable supplies to share for the office.
- ☐ When deciding on the meeting venue;
  - o State that you are interested in supporting the local food system
  - o Ask if menus are flexible to take advantage of locally-produced food
  - o Ask if the unserved food can be donated to a local agency such as a food bank, food pantry or soup kitchen.
- ☐ Employees are encouraged to consider healthier alternatives when making available food for others (nuts, dried fruits, vegetables, fresh fruit, etc.)

From: [www.preventioninstitute.org/SA/policies/pdf/text/ClarkCoNutPolicy.pdf](http://www.preventioninstitute.org/SA/policies/pdf/text/ClarkCoNutPolicy.pdf)  
[www.sne.org/guidelinesformetings.htm](http://www.sne.org/guidelinesformetings.htm)

## Sample Telecommuting Policy

Employees wishing to be considered for working by telecommuting must apply for such consideration. If granted, the supervisor and the employee will work out the arrangement. The arrangement will cover the following:

- ☐ The duties that will be performed away from the office;
- ☐ How deadlines will be handled;
- ☐ Hours to be worked;
- ☐ How hours worked will be recorded;
- ☐ If overtime is to be handled any differently than in the office, how it will be handled;
- ☐ The amount of notice to be given of any change in the arrangement;
- ☐ How much time the employee should spend in the office and when the employee should report back to the office;
- ☐ How the employee and the organization will be able to contact each other during the workday;
- ☐ Any changes in workplace policies that may be necessary due to the telecommuting arrangement; and
- ☐ The employee's understanding and agreement that the telecommuting arrangement is at the will of the organization and may be altered or terminated at any time.

From: <http://www.employmentlawadvisors.com/resources/policies/telecommutingpolicy.html>

## Sample Waste Reduction Policy

The following are sample waste reduction policies to support an agency's steps toward reducing waste:

The (Agency) shall continually strive to minimize the generation of waste and support markets for recycled materials through waste prevention, reuse, collection/recycling and composting, and the procurement of recycled content products.

### Waste Prevention and Reuse Policy Statements and Action Items

- ☐ Use available information technology to maximize the efficient use of paper (such as double-sided copies)
- ☐ Review standard documents, templates, and publications for waste reduction opportunities.
- ☐ Review standard distribution/circulation procedures for waste reduction opportunities
- ☐ Maximize waste prevention practices in the custodial, maintenance and landscaping practices of state-owned buildings (such as air dryers rather than paper towels in restroom).
- ☐ Establish systems that routinely reuse paper and other office supplies.

### Employee Education/Outreach Policy Statements and Action Items

- ☐ Develop an ongoing employee education and outreach campaign.
- ☐ Ensure all (Agency) documents carry a recycled logo and/or environmental policy statement.

### Recycling Collection Policy Statements and Action Items

- ☐ Provide, at a minimum, for collection of the following materials: white paper; newspaper; mixed paper; magazines, plastic, glass, and aluminum.
- ☐ Provide desktop recycling containers for employees.
- ☐ Provide clearly labeled recycling bins near copiers, shipping and receiving areas, and in employee eating areas.
- ☐ Print directly on envelopes rather than using labels to increase envelope recyclability.

*From: [www.employmentlawadvisors.com/resources/policies/telecommutingpolicy.html](http://www.employmentlawadvisors.com/resources/policies/telecommutingpolicy.html)*